

GenCore version 5.1.3
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OM protein - protein search, using sw model

Run on: October 21, 2002, 09:47:36 ; Search time 25 seconds
(without alignments)
207.594 Million cell updates/sec

Title: US-09-720-828A-4
Perfect score: 147
Sequence: 1 APTSSSTKKTQLQLEHLLLDLQMLNGINN 30

Scoring table: BLOSUM62
Gapop 10.0 , Gapext 0.5

Searched: 562222 seqs, 172994929 residues
Total number of hits satisfying chosen parameters: 562222

Minimum DB seq length: 0
Maximum DB seq length: 2000000000
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

Database : SPTREMBL19:*

1: sp_archaea:*

2: sp_bacteria:*

3: sp_fungi:*

4: sp_human:*

5: sp_invertebrate:*

6: sp_mammal:*

7: sp_mhc:*

8: sp_organelle:*

9: sp_phage:*

10: sp_plant:*

11: sp_rodent:*

12: sp_virus:*

13: sp_vertebrate:*

14: sp_unclassified:*

15: sp_virus:*

16: sp_bacteriaph:*

17: sp_archaeap:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	147	100.0	150	4 Q9C001	Q9C001 homo sapien
2	145	98.6	154	6 Q9XS38	Q9XS38 papio hamad
3	135.5	92.2	156	4 Q13169	Q13169 homo sapien
4	134	91.2	139	4 Q16334	Q16334 homo sapien
5	108.5	73.8	155	6 Q9XT83	Q9XT83 halichoerus
6	107.5	73.1	66	6 Q9BG74	Q9BG74 canis famil
7	107	72.8	79	6 Q9TV12	Q9TV12 canis famil
8	106	72.1	133	6 Q9WZ9	Q9WZ9 oryctolagus
9	106	72.1	155	11 Q9Z3T2	Q9Z3T2 sigmodon hi
10	103	70.1	138	11 Q70329	Q70329 mesocricetu
11	91	61.9	23	4 Q9UCF5	Q9UCF5 homo sapien
12	83	56.5	154	6 Q9XT84	Q9XT84 delphinapte
13	82	55.8	152	11 Q88210	Q88210 cavia porce
14	79	53.7	69	6 Q9GJR4	Q9GJR4 ovis aries
15	79	53.7	155	6 Q9GL83	Q9GL83 capra hircu
16	79	53.7	155	6 Q95WP4	Q95WP4 ovis aries

ALIGNMENTS

RESULT 1

Q9C001 ID Q9C001 PRELIMINARY; PRT: 150 AA.

AC Q9C001; 01-JUN-2001 (TrEMBLrel. 17, Created)
DT 01-JUN-2001 (TrEMBLrel. 17, Last sequence update)
DT 01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
DE INTERLEUKIN-2 (FRAGMENT).

OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
OX NCBI_TaxID=9606;

RN [1]
RP SEQUENCE FROM N.A.

RX MEDLINE=20545237; PubMed=11093171;
RA Matesanz F., Delgado C., Fresno M., Alcina A.;
RT "Allelic selection of human IL-2 gene.";
RL Eur. J. Immunol. 30:3516-3521(2000).
DR EMBL; AF228636; AAG53575.1; -

DR HSSP; P01585; 3INK.

DR InterPro; IPR000779; Interleukin-2.

DR Pfam; PF00715; IL2; 1.

DR PRINTS; PD00265; Interleukin-2.

DR PRODOM; PD003649; Interleukin-2; 1.

DR SMART; SM00189; IL2; 1.

DR PROSITE; PS00424; INTERLEUKIN_2; 1.

FT NON_TER 150

SO SEQUENCE 150 AA; 17312 MW; BF25860F8436ACE5 CRC64;

Query Match 100.0%; Score 147; DB 4; Length 150;

Best Local Similarity 100.0%; Pred. No. 1.4e-14;

Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

OY 1 APTSSSTKKTQLQLEHLLLDLQMLNGINN 30

|||||

Db 21 APTSSSTKKTQLQLEHLLLDLQMLNGINN 50

RESULT 2

```

DR ProDom; PD003649; Interleukin-2; 1.
DR SMART; SM00189; IL2; 1.
DR PROSITE; PS00424; INTERLEUKIN_2; 1.
SQ SEQUENCE 156 AA; 18002 MW; 8E0452D43B336389 CRC64;

Query Match
Best Local Similarity 92.2%; Score 135.5; DB 4; Length 156;
Matches 30; Conservative 0; Mismatches 0; Indels 3;

QY 1 APTSSS--TKKTQLEHLLLDLQMLNGINN 30
    ||||| ||||| ||||| ||||| |||||
Db 21 APTSSSTKTKTQLEHLLLDLQMLNGINN 53
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RESULT 4
Q16334 PRELIMINARY; PRT; 139 AA.
ID Q16334
AC Q16334;
DC 01-NOV-1996 (TREMBLrel. 01, Created)
DT 01-NOV-1996 (TREMBLrel. 01, Last sequence update)
DT 01-OCT-2001 (TREMBLrel. 18, Last annotation update)
DE IL-2 PROTEIN (FRAGMENT).
GN IL-2.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
OX NCBI_TaxID=9606;
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE=95239150; PubMed=7722480;
RA Eisenberg O., Faber-Elman A., Lotan M., Schwartz M.;
RT "Interleukin-2 transcripts in human and rodent brains: possible
RL expression by astrocytes.";
RL J. Neurochem. 64:1928-1936(1995).
DR EMBL; S77835; AAD14264.1; -.
DR HSSP; P01585; 3INK.
DR InterPro; IPR000779; Interleukin-2.
DR Pfam; PF00715; IL2; 1.
DR PRINTS; PR00265; INTERLEUKIN2.
DR ProDom; PD003649; Interleukin-2; 1.
DR SMART; SM00189; IL2; 1.
DR PROSITE; PS00424; INTERLEUKIN_2; 1.
FT NON_TER
FT 1
SQ SEQUENCE 139 AA; 15986 MW; 731FBA406D0C63C5 CRC64;

Query Match
Best Local Similarity 91.2%; Score 134; DB 4; Length 139;
Matches 28; Conservative 0; Mismatches 2; Indels 0;

QY 1 APTSSSTKTKTQLEHLLLDLQMLNGINN 30
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Db 17 APTSSSTKTKTQLEHLLLDLQMLXGINN 46
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RESULT 5
Q9XT83 PRELIMINARY; PRT; 155 AA.
ID Q9XT83
AC Q9XT83;
DC 01-NOV-1999 (TREMBLrel. 12, Created)
DT 01-NOV-1999 (TREMBLrel. 12, Last sequence update)
DT 01-DEC-2001 (TREMBLrel. 19, Last annotation update)
DE INTERLEUKIN 2.
OS Halichoerus grypus (Gray seal).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Carnivora; Pinnipedia; Phocidae; Halichoerus.
OX NCBI_TaxID=9711;
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE=99221046; PubMed=10206205;
RA St-Laurent G., Belliveau C., Archambault D.;
RT "Molecular cloning and phylogenetic analysis of beluga whale
RT 2.; (belphinapterus leucas) and grey seal (Halichoerus grypus) interl
RT 2.";
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OC Sigmodon.
OX NCBI_TaxID=42415;
RN [1]
RP SEQUENCE FROM N.A.
RA Darnell M.R., Pietneva L.M., Langley R.J., Blanco J.C., Prince G.A.;
RT "Cloning, expression and purification of cotton rat IL-2.";
RL Submitted (JUL-2001) to the EMBL/GenBank/DBJ databases.
DR EMBL; AF398549; AAK94012.1; -.
SQ SEQUENCE 155 AA; 17627 MW; ACADEA865E993291 CRC64;

Query Match 72.1%; Score 106; DB 11; Length 155;
Best Local Similarity 73.3%; Pred. No. 2.5e-08;
Matches 22; Conservative 3; Mismatches 5; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLLDLQMLINGINN 30
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Db 21 APTSSSTKKTQLEHLLLDLQMLINGINN 50

RESULT 10
O70329 PRELIMINARY; PRT; 138 AA.
AC O70329;
DT 01-AUG-1998 (TREMBLrel. 07, Created)
DT 01-AUG-1998 (TREMBLrel. 07, Last sequence update)
DT 01-OCT-2001 (TREMBLrel. 18, Last annotation update)
DE INTERLEUKIN-2 (FRAGMENT).
OS Mesocricetus auratus (Golden hamster).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;
OC Mesocricetus.
OX NCBI_TaxID=10036;
RN [1]
RP SEQUENCE FROM N.A.
RC TSSUB-SPLEEN;
RX MEDLINE=98234044; PubMed=9573100;
RA Melby P.C., Tryon V.V., Chandrasekar B., Freeman G.L.;
RT "Cloning of Syrian hamster (Mesocricetus auratus) cytokine cDNAs and
RT analysis of cytokine mRNA expression in experimental visceral
RT leishmaniasis.";
RL Infect. Immun. 66:2135-2142(1998).
DR EMBL; AF046212; AAC40097.1; -.
DR HSSP; P01585; 3INK.
DR InterPro; IPR000779; Interleukin-2.
DR Pfam; PF00715; IL2; 1.
DR PRINTS; PR00265; INTERLEUKIN2.
DR PRODOM; PD003649; Interleukin-2; 1.
DR SMART; SM00189; IL2; 1.
DR PROSITE; PS00424; INTERLEUKIN_2; 1.
FT NOW_ITER 1
FT NON_TER 138
SQ SEQUENCE 138 AA; 15739 MW; 3510329958G70779 CRC64;

Query Match 70.1%; Score 103; DB 11; Length 138;
Best Local Similarity 73.3%; Pred. No. 6.4e-08;
Matches 22; Conservative 2; Mismatches 6; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLLDLQMLINGINN 30
   |||||:|:| |||:|:|:|:|:|:|
Db 14 APTSSSTKKTQLEHLLLDLQMLINGINN 43

RESULT 11
O9UCF5 PRELIMINARY; PRT; 23 AA.
AC O9UCF5;
DT 01-MAY-2000 (TREMBLrel. 13, Created)
DT 01-MAY-2000 (TREMBLrel. 13, Last sequence update)
DT 01-JUN-2000 (TREMBLrel. 14, Last annotation update)
DE INTERLEUKIN 2 (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

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OX NCBI_TaxID=9606;
RN [1]
RP SEQUENCE.
RX MEDLINE=93289963; PubMed=8512072;
RA Mullner S., Karbe-Thonges B., Tripler D.;
RT "Charge heterogeneity of insulin fusion proteins expressed in
RT Escherichia coli is not due to proteolytic degradation.";
RL Anal. Biochem. 210:366-373(1993).
SQ SEQUENCE 23 AA; 2637 MW; 40B64C6875CE021F CRC64;

Query Match 61.9%; Score 91; DB 4; Length 23;
Best Local Similarity 90.5%; Pred. No. 7.1e-07;
Matches 19; Conservative 0; Mismatches 2; Indels 0; Gaps 0;

QY 3 TSSSTKKTQLEHLLLDLQML 23
   |||:|:|:|:|:|:|:|
Db 3 TSXSTRKTQLEHLLLDLQML 23

RESULT 12
O9XT84 PRELIMINARY; PRT; 154 AA.
AC O9XT84;
DT 01-NOV-1999 (TREMBLrel. 12, Created)
DT 01-NOV-1999 (TREMBLrel. 12, Last sequence update)
DT 01-DEC-2001 (TREMBLrel. 19, Last annotation update)
DE INTERLEUKIN 2.
OS Delphinapterus leucas (Beluga whale).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Cetacea; Odontoceti;
OC Monodontidae; Delphinapterus.
OX NCBI_TaxID=9749;
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE=99221046; PubMed=10206205;
RA St-Laurent G., Bellevue C., Archambault D.;
RT "Molecular cloning and phylogenetic analysis of beluga whale
RT (Delphinapterus leucas) and grey seal (Halichoerus grypus) interleukin
RT 2.";
RL Vet. Immunol. Immunopathol. 67:385-394(1999).
DR EMBL; AF072870; AAD40847.1; -.
DR HSSP; P01585; 3INK.
DR InterPro; IPR000779; Interleukin-2.
DR Pfam; PF00715; IL2; 1.
DR PRINTS; PR00265; INTERLEUKIN2.
DR PRODOM; PD003649; Interleukin-2; 1.
DR SMART; SM00189; IL2; 1.
DR PROSITE; PS00424; INTERLEUKIN_2; 1.
SQ SEQUENCE 154 AA; 17652 MW; 4288D3D41D04F172 CRC64;

Query Match 56.5%; Score 83; DB 6; Length 154;
Best Local Similarity 56.7%; Pred. No. 7.9e-05;
Matches 17; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLLDLQMLINGINN 30
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Db 21 APTSSSTKKTQLEHLLLDLQMLINGINN 50

RESULT 13
O88210 PRELIMINARY; PRT; 152 AA.
AC O88210;
DT 01-NOV-1998 (TREMBLrel. 08, Created)
DT 01-NOV-1998 (TREMBLrel. 08, Last sequence update)
DT 01-OCT-2001 (TREMBLrel. 18, Last annotation update)
DE INTERLEUKIN 2 PRECURSOR.
OS Cavia porcellus (Guinea pig).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.
OX NCBI_TaxID=10141;
RN [1]
RP SEQUENCE FROM N.A.

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DT 01-MAR-2001 (TrEMBLrel. 16, Last sequence update)
DE 01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
ID INTERLEUKIN 2.
GN IL-2.
OS Capra hircus (Goat).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae
OC Bovidae; Caprinae; Capra.
OX NCBI_taxID=9925;
[1]
RN SEQUENCE FROM N.A.
RA Ying O.H., Li X.R., Pan J.Y.;
RT "Cloning of the goat IL-2 gene and its expression in E.coli.";
RL Submitted (SEP-2000) to the EMBL/GenBank/DDAJ databases.
DR EMBL: AF307018; AAG28783.1; -.
DR HSSP: P01585; 31NK.
DR InterPro: IPR000779; Interleukin-2.
DR Pfam: PF00715; IL2; 1.
DR PRINTS: PR00265; INTERLEUKIN2.
DR ProDom: PD003649; Interleukin-2; 1.
DR SMART: SM00189; IL2; 1.
DR PROSITE: PS00424; INTERLEUKIN_2; 1.
SQ SEQUENCE 155 AA; 17605 MW; EE8E2DE18F5469AA CRC64;

Query Match 53.7%; Score 79; DB 6; Length 155;
Best Local Similarity 53.3%; Pred. No. 0.00032;
Matches 16; Conservative 6; Mismatches 8; Indels 0;

QY 1 APTSSSTKTKQLQLHLLDLQMLINGNN 30
DB 21 APTSSSTGNTKVKVSLLDLQLDLGKVKNN 50

Search completed: October 21, 2002, 09:49:35
Job time : 47 secs

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GenCore version 5.1.3
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OM protein - protein search, using sw model

Run on: October 21, 2002, 09:48:11 ; Search time 13 Seconds
(without alignments)
56.367 Million cell updates/sec

Title: US-09-720-828A-4

Perfect score: 147

Sequence: 1 APTSSSTKKTQLEHLLDQMLNGINN 30

Scoring table: BLOSUM62

Gapop 10.0 , Gapext 0.5

Searched: 231628 seqs, 24425594 residues

Total number of hits satisfying chosen parameters: 231628

Minimum DB seq length: 0

Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%

Maximum Match 100%

Listing first 45 summaries

Database : Issued_Patents_AA.*

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3: /cgn2.6/ptodata/1/iaa/6A_COMB.pep.*

4: /cgn2.6/ptodata/1/iaa/6B_COMB.pep.*

5: /cgn2.6/ptodata/1/iaa/PCTUS_COMB.pep.*

6: /cgn2.6/ptodata/1/iaa/backfiles1.pep.*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	147	100.0	31	4	US-09-116-594-2
2	147	100.0	50	1	US-08-127-351-13
3	147	100.0	50	1	US-08-480-367B-13
4	147	100.0	50	1	US-08-487-221A-13
5	147	100.0	50	1	US-08-480-370-13
6	147	100.0	88	4	US-08-817-787-15
7	147	100.0	96	1	US-08-160-376A-5
8	147	100.0	96	1	US-08-389-487-8
9	147	100.0	133	1	US-07-800-366-1
10	147	100.0	133	1	US-08-354-456A-5
11	147	100.0	133	1	US-08-225-224-3
12	147	100.0	133	1	US-08-318-193-89
13	147	100.0	133	1	US-08-284-393B-1
14	147	100.0	133	1	US-08-284-393B-2
15	147	100.0	133	1	US-08-284-393B-3
16	147	100.0	133	1	US-08-734-471-1
17	147	100.0	133	3	US-08-722-258-3
18	147	100.0	133	4	US-08-817-787-13
19	147	100.0	133	4	US-09-310-026-1
20	147	100.0	133	5	PCT-US95-04488-3
21	147	100.0	133	5	PCT-US95-08950-1
22	147	100.0	133	5	PCT-US95-08950-2
23	147	100.0	133	5	PCT-US95-08950-3
24	147	100.0	133	6	5210029-1
25	147	100.0	133	6	5256769-1
26	147	100.0	133	6	5464939-2
27	147	100.0	134	6	5496924-55

28 147 100.0 153 3 US-09-012-366-3 Sequence 3, Appli
29 147 100.0 153 4 US-08-759-628-8 Sequence 8, Appli
30 147 100.0 153 4 US-09-522-217-111 Sequence 111, App
31 147 100.0 153 6 5314995-7 Patent No. 5314995
32 147 100.0 157 4 US-08-818-562-2 Sequence 2, Appli
33 147 100.0 478 3 US-08-155-888-2 Sequence 2, Appli
34 147 100.0 504 1 US-07-932-915-2 Sequence 2, Appli
35 147 100.0 504 5 PCT-US91-05826-2 Sequence 2, Appli
36 144 98.0 251 3 US-08-875-811-59 Sequence 59, Appl
37 144 98.0 254 3 US-08-875-811-61 Sequence 2, Appli
38 143 97.3 133 1 US-08-354-456A-6 Sequence 61, Appli
39 132.5 90.1 127 3 US-08-806-121B-3 Sequence 6, Appli
40 102 69.4 141 4 US-08-930-917A-18 Sequence 3, Appli
41 79 53.7 135 2 US-08-383-621-5 Sequence 18, Appli
42 79 53.7 135 3 US-08-459-906-5 Sequence 5, Appli
43 79 53.7 1098 1 US-07-777-715-7 Sequence 5, Appli
44 79 53.7 1098 1 US-08-170-126-2 Sequence 7, Appli
45 79 53.7 1098 3 US-08-954-418-2 Sequence 2, Appli

ALIGNMENTS

RESULT 1

US-09-116-594-2

; Sequence 2, Application US/09116594

; Patent No. 6168785

; GENERAL INFORMATION:

; APPLICANT: THEZE, Jacques

; APPLICANT: ECKENBERG, Ralph

; APPLICANT: MOREAU, Jean-Louis

; APPLICANT: MAZIE, Jean-Claude

; TITLE OF INVENTION: BIOLOGICAL APPLICATIONS OF NEW PEPTIDES OF IL-2 AND

; TITLE OF INVENTION: DERIVATIVES AND USE AS THERAPEUTIC AGENTS

; FILE REFERENCE: 0660-0134-0

; CURRENT APPLICATION NUMBER: US/09/116,594

; CURRENT FILING DATE: 1998-07-16

; NUMBER OF SEQ ID NOS: 2

; SOFTWARE: PatentIn Ver. 2.1

; SEQ ID NO 2

; LENGTH: 31

; TYPE: PRT

; ORGANISM: Artificial Sequence

; FEATURE:

; OTHER INFORMATION: Description of Artificial Sequence:peptide

US-09-116-594-2

Query Match 100.0%; Score 147; DB 4; Length 31;

Best Local Similarity 100.0%; Pred. No. 1.9e-16;

Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

OY 1 APTSSSTKKTQLEHLLDQMLNGINN 30

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Db 2 APTSSSTKKTQLEHLLDQMLNGINN 31

|||||

RESULT 2

US-08-127-351-13

; Sequence 13, Application US/08127351

; Patent No. 5449761

; GENERAL INFORMATION:

; APPLICANT: BELINKA JR, BENJAMIN A.

; APPLICANT: COUGHLIN, DANIEL J.

; APPLICANT: ALVAREZ, VERNON L.

; APPLICANT: WOOD, RICHARD

; TITLE OF INVENTION: METAL-BINDING TARGETED POLYPEPTIDE

; TITLE OF INVENTION: CONSTRUCTS

; NUMBER OF SEQUENCES: 56

; CORRESPONDENCE ADDRESS:

; ADDRESSEE: OBLON, SPIVAK, MCLELLAND, MAIER &

; ADDRESSEE: NEUSTADT,

; ADDRESSEE: P.C.

; STREET: 1755 S. Jefferson Davis Highway, Suite 400

CITY: Arlington
STATE: Virginia
COUNTRY: U.S.A.
ZIP: 22202
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/127,351
FILING DATE: 28-SEP-1993
CLASSIFICATION: 534
ATTORNEY/AGENT INFORMATION:
NAME: Villacorta, Gilberto M.
REGISTRATION NUMBER: 34,038
REFERENCE/DOCKET NUMBER: 4980-004-44
TELEPHONE: (703) 413-3000
TELEFAX: (703) 413-2220
TELEX: 248855 OPAT UR
INFORMATION FOR SEQ ID NO: 13:
SEQUENCE CHARACTERISTICS:
LENGTH: 50 amino acids
TYPE: amino acid
TOPOLOGY: unknown
MOLECULE TYPE: peptide
US-08-127-351-13

Query Match 100.0%; Score 147; DB 1; Length 50;
Best Local Similarity 100.0%; Pred. No. 3.4e-16;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30
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Db 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30

RESULT 3
US-08-480-367B-13
Sequence 13, Application US/08480367B
Patent No. 5578288
GENERAL INFORMATION:
APPLICANT: BELINKA JR, BENJAMIN A.
APPLICANT: COUGHLIN, DANIEL J.
APPLICANT: ALVAREZ, VERNON L.
APPLICANT: WOOD, RICHARD
TITLE OF INVENTION: METAL-BINDING TARGETED POLYPEPTIDE
NUMBER OF SEQUENCES: 56
CORRESPONDENCE ADDRESS:
ADDRESSEE: LOWE, PRICE, LeBLANC & BECKER
STREET: 99 Canal Center Plaza, Suite 300
CITY: Alexandria
STATE: Virginia
COUNTRY: U.S.A.
ZIP: 22314
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
FILING DATE: 07-06-95
CLASSIFICATION: 424
ATTORNEY/AGENT INFORMATION:
NAME: Villacorta, Gilberto M.
REGISTRATION NUMBER: 34,038
REFERENCE/DOCKET NUMBER: 2654-002A
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 684-1111
TELEFAX: (703) 684-1124

TELEX:
INFORMATION FOR SEQ ID NO: 13:
SEQUENCE CHARACTERISTICS:
LENGTH: 50 amino acids
TYPE: amino acid
TOPOLOGY: unknown
MOLECULE TYPE: peptide
US-08-480-367B-13

Query Match 100.0%; Score 147; DB 1; Length 50;
Best Local Similarity 100.0%; Pred. No. 3.4e-16;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30
|||||
Db 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30

RESULT 4
US-08-487-221A-13
Sequence 13, Application US/08487221A
Patent No. 5593656
GENERAL INFORMATION:
APPLICANT: BELINKA JR, BENJAMIN A.
APPLICANT: COUGHLIN, DANIEL J.
APPLICANT: ALVAREZ, VERNON L.
APPLICANT: WOOD, RICHARD
TITLE OF INVENTION: METAL-BINDING TARGETED POLYPEPTIDE
NUMBER OF SEQUENCES: 56
CORRESPONDENCE ADDRESS:
ADDRESSEE: OBLON, SPIVAK, McLELLAND, MAIER &
ADDRESS: NEUSTADT, P.C.
STREET: 1755 S. Jefferson Davis Highway, Suite 400
CITY: Arlington
STATE: Virginia
COUNTRY: U.S.A.
ZIP: 22202
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/487,221A
FILING DATE: 07-JUN-1995
CLASSIFICATION: 424
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/127,351
FILING DATE: 28-SEP-1993
ATTORNEY/AGENT INFORMATION:
NAME: Villacorta, Gilberto M.
REGISTRATION NUMBER: 34,038
REFERENCE/DOCKET NUMBER: 4980-004-44
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 413-3000
TELEFAX: (703) 413-2220
TELEX: 248855 OPAT UR
INFORMATION FOR SEQ ID NO: 13:
SEQUENCE CHARACTERISTICS:
LENGTH: 50 amino acids
TYPE: amino acid
TOPOLOGY: unknown
MOLECULE TYPE: peptide
US-08-487-221A-13

Query Match 100.0%; Score 147; DB 1; Length 50;
Best Local Similarity 100.0%; Pred. No. 3.4e-16;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30
|||||
Db 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30


```
RESULT 5
US-08-480-370-13
; Sequence 13, Application US/08480370
; Patent No. 5609847
; GENERAL INFORMATION:
; APPLICANT: BELINKA JR, BENJAMIN A.
; APPLICANT: COUGHLIN, DANIEL J.
; APPLICANT: ALVAREZ, VERNON L.
; APPLICANT: WOOD, RICHARD
; TITLE OF INVENTION: METAL-BINDING TARGETED POLYPEPTIDE
; NUMBER OF SEQUENCES: 56
; CORRESPONDENCE ADDRESS:
; ADDRESSEE: OBLON, SPIVAK, MCCLELLAND, MAIER &
; ADDRESSEE: NEUSTADT,
; ADDRESSEE: P.C.
; STREET: 1755 S. Jefferson Davis Highway, Suite 400
; CITY: Arlington
; STATE: Virginia
; COUNTRY: U.S.A.
; ZIP: 22202
; COMPUTER READABLE FORM:
; MEDIUM TYPE: Floppy disk
; COMPUTER: IBM PC compatible
; OPERATING SYSTEM: PC-DOS/MS-DOS
; SOFTWARE: Patentin Release #1.0, Version #1.25
; CURRENT APPLICATION DATA:
; APPLICATION NUMBER: US/08/480,370
; FILING DATE:
; CLASSIFICATION: 424
; PRIOR APPLICATION DATA:
; APPLICATION NUMBER: US 08/127,351
; FILING DATE: 28-SEP-1993
; ATTORNEY/AGENT INFORMATION:
; NAME: Villacorta, Gilberto M.
; REGISTRATION NUMBER: 34,038
; REFERENCE/DOCKET NUMBER: 4980-004-44
; TELEPHONE: (703) 413-3000
; TELEFAX: (703) 413-2220
; TELEX: 248855 OPAT UR
; INFORMATION FOR SEQ ID NO: 13:
; SEQUENCE CHARACTERISTICS:
; LENGTH: 50 amino acids
; TYPE: amino acid
; TOPOLOGY: unknown
; MOLECULE TYPE: peptide
US-08-480-370-13

Query Match 100.0%; Score 147; DB 1; Length 50;
Best Local Similarity 100.0%; Pred. No. 3.4e-16;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKTKTQLEHLLLDLQMLNGINN 30
Db 1 APTSSSTKTKTQLEHLLLDLQMLNGINN 30

RESULT 6
US-08-817-787-15
; Sequence 15, Application US/08817787
; Patent No. 6294353
; GENERAL INFORMATION:
; APPLICANT: Pack, Peter
; APPLICANT: Lupas, Andrei
; TITLE OF INVENTION: TARGETED HETERO-ASSOCIATION OF
; TITLE OF INVENTION: RECOMBINANT PROTEINS TO MULTI-FUNCTIONAL COMPLEXES
; NUMBER OF SEQUENCES: 36
; CORRESPONDENCE ADDRESS:
; ADDRESSEE: FISH & NEAVE
; STREET: 1251 Avenue of the Americas
```

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; CITY: New York
; STATE: New York
; COUNTRY: USA
; ZIP: 10020
; COMPUTER READABLE FORM:
; MEDIUM TYPE: Floppy disk
; COMPUTER: IBM PC compatible
; OPERATING SYSTEM: PC-DOS/MS-DOS
; SOFTWARE: Patentin Release #1.0, Version #1.30
; CURRENT APPLICATION DATA:
; APPLICATION NUMBER: US/08/817,787
; FILING DATE: 23-SEP-1997
; CLASSIFICATION: 424
; PRIOR APPLICATION DATA:
; APPLICATION NUMBER: PCT/EP95/04117
; FILING DATE:
; PRIOR APPLICATION DATA:
; APPLICATION NUMBER: EP 94 11 6558.1
; FILING DATE: 20-OCT-1994
; ATTORNEY/AGENT INFORMATION:
; NAME: Haley Jr., James F.
; REGISTRATION NUMBER: 27,794
; REFERENCE/DOCKET NUMBER: MORPHO/1
; TELECOMMUNICATION INFORMATION:
; TELEPHONE: 212-596-9000
; TELEFAX: 212-596-9090
; INFORMATION FOR SEQ ID NO: 15:
; SEQUENCE CHARACTERISTICS:
; LENGTH: 88 amino acids
; TYPE: amino acid
; TOPOLOGY: linear
; MOLECULE TYPE: protein
US-08-817-787-15

Query Match 100.0%; Score 147; DB 4; Length 88;
Best Local Similarity 100.0%; Pred. No. 6.8e-16;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKTKTQLEHLLLDLQMLNGINN 30
Db 3 APTSSSTKTKTQLEHLLLDLQMLNGINN 32

RESULT 7
US-08-160-376A-5
; Sequence 5, Application US/08160376A
; Patent No. 5473049
; GENERAL INFORMATION:
; APPLICANT: Obermeier, Ranier
; APPLICANT: Gerl, Martin
; APPLICANT: Ludwig, Jurgen
; APPLICANT: Sabel, Walter
; TITLE OF INVENTION: Process For Obtaining Proinsulin
; TITLE OF INVENTION: Possessing Correctly Linked
; TITLE OF INVENTION: Cystine Bridges
; NUMBER OF SEQUENCES: 7
; CORRESPONDENCE ADDRESS:
; ADDRESSEE: Kenneth A. Genoni, Esq.
; STREET: Rt. 202-206 No. 5473049th/P.O. Box 2500
; CITY: Somerville
; STATE: New Jersey
; COUNTRY: U.S.A.
; ZIP: 08876-1258
; COMPUTER READABLE FORM:
; MEDIUM TYPE: DISKETTE, 3.5 INCH, 1.44 Mb STORAGE
; COMPUTER: IBM 386
; OPERATING SYSTEM: WINDOWS 3.1
; SOFTWARE: WORDPERFECT 5.1
; CURRENT APPLICATION DATA:
; APPLICATION NUMBER: US/08/160,376A
; FILING DATE: December 1, 1993
; CLASSIFICATION: 530
; PRIOR APPLICATION DATA:
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APPLICATION NUMBER: GE P 4240420.7
FILING DATE: December 2, 1992
ATTORNEY/AGENT INFORMATION:
NAME: Barbara V. Maurer, Esq.
REGISTRATION NUMBER: 31,287
REFERENCE/DOCKET NUMBER: HOE 92/F 384
TELECOMMUNICATION INFORMATION:
TELEPHONE: (908) 231-4079
TELEFAX: (908) 231-2255
INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 96 Amino Acids
TYPE: Amino Acid (AA)
TOPOLOGY: not relevant
US-08-160-376A-5

Query Match 100.0%; Score 147; DB 1; Length 96;
Best Local Similarity 100.0%; Pred. No. 7.6e-16;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Qy 1 APTSSSTKKTQLEHLLDLMILNGINN 30
|||||
Db 2 APTSSSTKKTQLEHLLDLMILNGINN 31

RESULT 8
US-08-389-487-8
Sequence 8, Application US/08389487
Patent No. 5653291
GENERAL INFORMATION:
APPLICANT: Obermeyer, Rainer
APPLICANT: Gerl, Martin
APPLICANT: Ludwig, Jurgen
APPLICANT: Sabel, Walter
TITLE OF INVENTION: Process for Obtaining Insulin Having
Correctly Linked Cysteine Bridges
NUMBER OF SEQUENCES: 12
CORRESPONDENCE ADDRESS:
ADDRESSEE: Finnegan, Henderson, Farabow, Garrett &
Dunner
STREET: 1300 I Street, N.W.
CITY: Washington
STATE: D.C.
COUNTRY: United States of America
ZIP: 20005-3315
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/389,487
FILING DATE:
CLASSIFICATION: 530
ATTORNEY/AGENT INFORMATION:
NAME: Einaudi, Carol P.
REGISTRATION NUMBER: 32,220
REFERENCE/DOCKET NUMBER: 02481.1424-00000
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202-408-4000
TELEFAX: 202-408-4000
INFORMATION FOR SEQ ID NO: 8:
SEQUENCE CHARACTERISTICS:
LENGTH: 96 amino acids
TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: peptide
US-08-389-487-8

Query Match 100.0%; Score 147; DB 1; Length 96;
Best Local Similarity 100.0%; Pred. No. 7.6e-16;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Qy 1 APTSSSTKKTQLEHLLDLMILNGINN 30
|||||
Db 2 APTSSSTKKTQLEHLLDLMILNGINN 31

RESULT 9
US-07-800-366-1
Sequence 1, Application US/07800366
Patent No. 5250296
GENERAL INFORMATION:
APPLICANT: OOTSU, Koichiro
TITLE OF INVENTION: IMMUNOSTIMULANT AGENT CONTAINING
INTERLEUKIN-2 AND 5'-DEOXY-5-FLUOROURIDINE
NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
ADDRESSEE: DAVID G. CONLIN; DIKE, BRONSTEIN, ROBERTS &
ADDRESSEE: CUSHMAN
STREET: 130 Water Street
CITY: Boston
STATE: Massachusetts
COUNTRY: US
ZIP: 02109
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/07/800,366
FILING DATE: 19911127
CLASSIFICATION: 424
ATTORNEY/AGENT INFORMATION:
NAME: Castle, Donald R.
REGISTRATION NUMBER: 24,220
REFERENCE/DOCKET NUMBER: 41417(281)
TELECOMMUNICATION INFORMATION:
TELEPHONE: (617)523-3400
TELEFAX: (617)523-6440
TELEX: 200291 STRE UR
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
LENGTH: 133 amino acids
TYPE: AMINO ACID
TOPOLOGY: linear
MOLECULE TYPE: protein
US-07-800-366-1

Query Match 100.0%; Score 147; DB 1; Length 133;
Best Local Similarity 100.0%; Pred. No. 1.1e-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Qy 1 APTSSSTKKTQLEHLLDLMILNGINN 30
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Db 1 APTSSSTKKTQLEHLLDLMILNGINN 30

RESULT 10
US-08-354-456A-5
Sequence 5, Application US/08354456A
Patent No. 5567611
GENERAL INFORMATION:
APPLICANT: Ralph, Peter
APPLICANT: Martin, George
APPLICANT: Platek, Michael
APPLICANT: Larrick, James W.
TITLE OF INVENTION: Multifunctional M-CSF Proteins and Genes Encoding
NUMBER OF SEQUENCES: 9
CORRESPONDENCE ADDRESS:
ADDRESSEE: CHIRON CORPORATION
STREET: Intellectual Property - R440, P.O. Box 8097
CITY: Emeryville

STATE: California
COUNTRY: U.S.A.
ZIP: 94662-8097
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patent In Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/354.456A
FILING DATE: 12-DEC-1994
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 07/995,338
FILING DATE: 21-DEC-1992
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: McGarrigle Jr., Phillip L.
REGISTRATION NUMBER: 31,395
REFERENCE/DOCKET NUMBER: 750.003/32387
TELECOMMUNICATION INFORMATION:
TELEPHONE: (510) 601-2718
TELEFAX: (510) 655-3542
TELEX: n/a
INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 133 amino acids
TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: protein
US-08-354-456A-5

Query Match 100.0%; Score 147; DB 1; Length 133;
Best Local Similarity 100.0%; Pred. No. 1.1e-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30
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DB 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30

RESULT 11
US-08-225-224-3
Sequence 3, Application US/08225224
Patent No. 5635599
GENERAL INFORMATION:
APPLICANT: PASTAN, Ira
APPLICANT: KREITMAN, Robert J.
TITLE OF INVENTION: CIRCULARLY PERMUTATED LIGANDS AND
TITLE OF INVENTION: CIRCULARLY PERMUTATED FUSION PROTEINS
NUMBER OF SEQUENCES: 57
CORRESPONDENCE ADDRESS:
ADDRESSEE: Townsend and Townsend Khourie and Crew
STREET: Steuart Street Tower, One Market Plaza
CITY: San Francisco
STATE: California
COUNTRY: US
ZIP: 94105-1493
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patent In Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/225,224
FILING DATE: 8-APR-1994
CLASSIFICATION: 530
ATTORNEY/AGENT INFORMATION:
NAME: Weber, Ellen L.
REGISTRATION NUMBER: 32,762
REFERENCE/DOCKET NUMBER: 15280-193
TELECOMMUNICATION INFORMATION:

TELEPHONE: (415) 543-9600
TELEFAX: (415) 543-5043
INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
LENGTH: 133 amino acids
TYPE: amino acid
STRANDEDNESS: unknown
TOPOLOGY: unknown
MOLECULE TYPE: protein
FEATURE:
NAME/KEY: Protein
LOCATION: 1..133
OTHER INFORMATION: /label= IL2
US-08-225-224-3

Query Match 100.0%; Score 147; DB 1; Length 133;
Best Local Similarity 100.0%; Pred. No. 1.1e-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30
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DB 1 APTSSSTKKTQLQLEHLLDLQMLNGINN 30

RESULT 12
US-08-318-193-89
Sequence 89, Application US/08318193
Patent No. 5641663
GENERAL INFORMATION:
APPLICANT: GARVIN, Robert T.
APPLICANT: MALEK, Lawrence T.
TITLE OF INVENTION: AN EXPRESSION SYSTEM FOR THE SECRETION
TITLE OF INVENTION: OF BIOACTIVE HUMAN GRANULOCYTE MACROPHAGE COLONY
TITLE OF INVENTION: STIMULATING FACTOR (GM-CSF) AND OTHER HETEROLOGOUS
TITLE OF INVENTION: PROTEINS FROM STREPTOMYCES
NUMBER OF SEQUENCES: 91
CORRESPONDENCE ADDRESS:
ADDRESSEE: Foley & Lardner
STREET: 1800 Diagonal Road, Suite 500
CITY: Alexandria
STATE: Virginia
COUNTRY: USA
ZIP: 22313-0299
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patent In Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/318,193
FILING DATE:
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/07/935,314
FILING DATE:
APPLICATION NUMBER: US 07/224,568
ATTORNEY/AGENT INFORMATION:
NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 18740/116 CACO
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703)836-9300
TELEFAX: (703)683-4109
TELEX: 899149
INFORMATION FOR SEQ ID NO: 89:
SEQUENCE CHARACTERISTICS:
LENGTH: 133 amino acids
TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
US-08-318-193-89

Query Match

100.0%; Score 147; DB 1; Length 133;

Best Local Similarity 100.0%; Pred. No. 1.le-15; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDQMLNGINN 30
|||||
DB 1 APTSSSTKKTQLEHLLDQMLNGINN 30

RESULT 13

US-08-284-393B-1
; Sequence 1, Application US/08284393B
; Patent No. 5696234
; GENERAL INFORMATION:
; APPLICANT: Zurawski, Sandra M.
; APPLICANT: Zurawski, Gerard
; TITLE OF INVENTION: MUTEINS OF MAMMALIAN CYTOKINES
; NUMBER OF SEQUENCES: 16
; CORRESPONDENCE ADDRESS:
; ADDRESSEE: DNAX Research Institute
; STREET: 901 California Avenue
; CITY: Palo Alto
; STATE: California
; COUNTRY: USA
; ZIP: 94304-1104

; COMPUTER READABLE FORM:
; MEDIUM TYPE: Floppy disk
; COMPUTER: IBM PC compatible
; OPERATING SYSTEM: PC-DOS/MS-DOS
; SOFTWARE: PatentIn Release #1.0, Version #1.30
; CURRENT APPLICATION DATA:
; APPLICATION NUMBER: US/08/284.393B
; FILING DATE: 01-AUG-1994
; CLASSIFICATION: 435

; ATTORNEY/AGENT INFORMATION:
; NAME: Ching, Edwin P.
; REGISTRATION NUMBER: 34,090
; REFERENCE/DOCKET NUMBER: DX0389
; TELEPHONE: 415-852-9196
; TELEFAX: 415-496-1200
; INFORMATION FOR SEQ ID NO: 1:
; SEQUENCE CHARACTERISTICS:
; LENGTH: 133 amino acids
; TYPE: amino acid
; STRANDEDNESS: single
; TOPOLOGY: linear
; MOLECULE TYPE: peptide
US-08-284-393B-1

Query Match 100.0%; Score 147; DB 1; Length 133;
Best Local Similarity 100.0%; Pred. No. 1.le-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDQMLNGINN 30
|||||
DB 1 APTSSSTKKTQLEHLLDQMLNGINN 30

RESULT 14

US-08-284-393B-2
; Sequence 2, Application US/08284393B
; Patent No. 5696234
; GENERAL INFORMATION:
; APPLICANT: Zurawski, Sandra M.
; APPLICANT: Zurawski, Gerard
; TITLE OF INVENTION: MUTEINS OF MAMMALIAN CYTOKINES
; NUMBER OF SEQUENCES: 16
; CORRESPONDENCE ADDRESS:
; ADDRESSEE: DNAX Research Institute
; STREET: 901 California Avenue
; CITY: Palo Alto
; STATE: California
; COUNTRY: USA

; ZIP: 94304-1104
; COMPUTER READABLE FORM:
; MEDIUM TYPE: Floppy disk
; COMPUTER: IBM PC compatible
; OPERATING SYSTEM: PC-DOS/MS-DOS
; SOFTWARE: PatentIn Release #1.0, Version #1.30
; CURRENT APPLICATION DATA:
; APPLICATION NUMBER: US/08/284.393B
; FILING DATE: 01-AUG-1994
; CLASSIFICATION: 435

; ATTORNEY/AGENT INFORMATION:
; NAME: Ching, Edwin P.
; REGISTRATION NUMBER: 34,090
; REFERENCE/DOCKET NUMBER: DX0389
; TELECOMMUNICATION INFORMATION:
; TELEPHONE: 415-852-9196
; TELEFAX: 415-496-1200
; INFORMATION FOR SEQ ID NO: 2:
; SEQUENCE CHARACTERISTICS:
; LENGTH: 133 amino acids
; TYPE: amino acid
; STRANDEDNESS: single
; TOPOLOGY: linear
; MOLECULE TYPE: peptide
US-08-284-393B-2

Query Match 100.0%; Score 147; DB 1; Length 133;
Best Local Similarity 100.0%; Pred. No. 1.le-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDQMLNGINN 30
|||||
DB 1 APTSSSTKKTQLEHLLDQMLNGINN 30

RESULT 15

US-08-284-393B-3
; Sequence 3, Application US/08284393B
; Patent No. 5696234
; GENERAL INFORMATION:
; APPLICANT: Zurawski, Sandra M.
; APPLICANT: Zurawski, Gerard
; TITLE OF INVENTION: MUTEINS OF MAMMALIAN CYTOKINES
; NUMBER OF SEQUENCES: 16
; CORRESPONDENCE ADDRESS:
; ADDRESSEE: DNAX Research Institute
; STREET: 901 California Avenue
; CITY: Palo Alto
; STATE: California
; COUNTRY: USA
; ZIP: 94304-1104

; COMPUTER READABLE FORM:
; MEDIUM TYPE: Floppy disk
; COMPUTER: IBM PC compatible
; OPERATING SYSTEM: PC-DOS/MS-DOS
; SOFTWARE: PatentIn Release #1.0, Version #1.30
; CURRENT APPLICATION DATA:
; APPLICATION NUMBER: US/08/284.393B
; FILING DATE: 01-AUG-1994
; CLASSIFICATION: 435

; ATTORNEY/AGENT INFORMATION:
; NAME: Ching, Edwin P.
; REGISTRATION NUMBER: 34,090
; REFERENCE/DOCKET NUMBER: DX0389
; TELECOMMUNICATION INFORMATION:
; TELEPHONE: 415-852-9196
; TELEFAX: 415-496-1200
; INFORMATION FOR SEQ ID NO: 3:
; SEQUENCE CHARACTERISTICS:
; LENGTH: 133 amino acids
; TYPE: amino acid
; STRANDEDNESS: single
; TOPOLOGY: linear

MOLECULE TYPE: peptide
US-08-284-393B-3

Query Match 100.0%; Score 147; DB 1; Length 133;
Best Local Similarity 100.0%; Pred. No. 1.1e-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTRKTQLEHLLDLQMLNGINN 30
|||||
Db 1 APTSSSTRKTQLEHLLDLQMLNGINN 30

Search completed: October 21, 2002, 09:50:15
Job time : 13 secs

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OM protein - protein search, using sw model

Run on: October 21, 2002, 09:47:01 ; Search time 10 Seconds
(without alignments)
116.159 Million cell updates/sec

Title: US-09-720-828A-4
Perfect score: 147
Sequence: 1 APTSSSTKTKTQLEHLLDQLMILNGINN 30

Scoring table: BLOSUM62
Gapop 10.0 , Gapext 0.5

Searched: 105224 seqs, 38719550 residues
Total number of hits satisfying chosen parameters: 105224

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

Database : SwissProt_40:*

Pred. No. is the number of results predicted by chance to have a
score greater than or equal to the score of the result being printed,
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	DB ID	Description
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2	147	100.0	154	1 IL2_MACFA	Q29615 macaca fasc
3	147	100.0	154	1 IL2_MACMU	P51498 macaca mula
4	142	96.6	154	1 IL2_CERTO	P46649 cercocobus
5	116	78.9	154	1 IL2_MIRAN	O62641 mirounga an
6	114	77.6	154	1 IL2_FEICA	Q07885 felis silve
7	107.5	73.1	155	1 IL2_CANFA	Q29416 canis famil
8	107	72.8	153	1 IL2_RABIT	O77620 oryctolagus
9	97	66.0	155	1 IL2_RAT	P17108 rattus norv
10	96	65.3	154	1 IL2_PIG	P26891 sus scrofa
11	95	64.6	155	1 IL2_MERUN	O08081 meriones un
12	92	62.6	149	1 IL2_HORSE	P37997 equus cabal
13	88	59.9	152	1 IL2_ORCOR	O97513 orcinus orc
14	79	53.7	155	1 IL2_BOVIN	P05016 bos taurus
15	79	53.7	155	1 IL2_CAPHI	P36835 capra hircu
16	79	53.7	155	1 IL2_SHEEP	P19114 ovis aries
17	79	53.7	162	1 IL2_CEREL	P51747 cervus elap
18	64.5	43.9	166	1 IL2_MOUSE	Q08867 mus spretus
19	64	43.5	169	1 IL2_MOUSE	P04351 mus musculu
20	54	36.7	357	1 AAAA_EMENI	P21133 emericeffa
21	51	34.7	627	1 FLGK_BORBU	P70859 borrelia bu
22	50	34.0	1046	1 POL_SIVAG	P27980 simian immu
23	48	32.7	155	1 YHCH_HAEIN	P44583 haemophilus
24	48	32.7	189	1 Y064_METJA	Q60376 methanococc
25	48	32.7	1061	1 POL_SIVAT	P05895 simian immu
26	47.5	32.3	938	1 PM15_CHLPN	O92883 chlamydia p
27	46	31.3	293	1 Y347_HELPJ	O92mal helicobacte
28	46	31.3	1612	1 DNMA_PARLI	Q27746 paracentrot
29	45	30.6	333	1 A85C_MYCLE	Q05862 mycobacteri
30	45	30.6	870	1 POL_JSRV	P31623 sheep pulmo
31	45	30.6	903	1 MSP1_SCHPO	P87320 schizosacch
32	45	30.6	1158	1 ALAL_ARATH	P98204 arabidopsis
33	44.5	30.3	511	1 D0P1_DROME	P41596 drosophila

34	44.5	30.3	741	1 RN5A_HUMAN	Q05823 homo sapien
35	44	29.9	81	1 EX7S_PASMU	O9cna0 pasteurella
36	44	29.9	357	1 CAD4_TOBAC	P30359 nicotiana t
37	44	29.9	357	1 CAD9_TOBAC	P30360 nicotiana t
38	44	29.9	368	1 LEU3_NEUCR	P34738 neurospora
39	44	29.9	474	1 SYFA_ARCFU	O28324 archaeoglob
40	44	29.9	625	1 XYNA_PIRSP	Q12667 piromyces s
41	44	29.9	627	1 YHAB_YEAST	P38750 saccharomyc
42	44	29.9	715	1 LCCL_LACLA	O9cjb8 lactococcus
43	44	29.9	943	1 YLW5_CAEEL	P34408 caenorhabdi
44	44	29.9	1019	1 POL_SIVS4	P12502 simian immu
45	44	29.9	1034	1 ACRF_ECOLI	P24181 escherichia

ALIGNMENTS

RESULT 1					
IL2_HUMAN					
ID	IL2_HUMAN	STANDARD;	PRT;	153 AA.	
AC	P01585;				
DT	21-JUL-1986	(Rel. 01, Created)			
DT	21-JUL-1986	(Rel. 01, Last sequence update)			
DT	01-MAR-2002	(Rel. 41, Last annotation update)			
DE	Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF)				
DE	(Aldesleukin).				
GN	IL2.				
OS	Homo sapiens (Human), and				
OS	Hylobates lar (Common gibbon).				
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;				
OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.				
OX	NCBI_TaxID=9606, 9580;				
RN	[1]				
RP	SEQUENCE FROM N.A.				
RC	SPECIES=Human;				
RX	MEDLINE=84247353; PubMed=6330695;				
RA	Holbrook N.J., Lieber M., Crabtree G.R.;				
RT	"DNA sequence of the 5' flanking region of the human interleukin 2				
RT	gene: homologues with adult T-cell leukemia virus.;"				
RL	Nucleic Acids Res. 12:5005-5013(1984).				
RN	[2]				
RP	SEQUENCE FROM N.A.				
RC	SPECIES=Human;				
RX	MEDLINE=83167472; PubMed=6403867;				
RA	Taniguchi T., Matsui H., Fujita T., Takaoka C., Kashima N.,				
RT	"Structure and expression of a cloned cDNA for human interleukin-2.;"				
RL	Nature 302:305-310(1983).				
RN	[3]				
RP	SEQUENCE FROM N.A.				
RC	SPECIES=Human;				
RX	MEDLINE=84023840; PubMed=6312994;				
RA	Maeda S., Nishino N., Obaru K., Mita S., Nomiya H., Shimada K.,				
RT	Fujimoto K., Teranishi T., Hirano T., Onoue K.;				
RL	"Cloning of interleukin 2 mRNAs from human tonsils.;"				
RN	[4]				
RP	SEQUENCE FROM N.A.				
RC	SPECIES=Human;				
RX	MEDLINE=83246551; PubMed=6306584;				
RA	Devos R., Plaetinck G., Cheroutre H., Simons G., Degraeve W.,				
RT	"Molecular cloning of human interleukin 2 cDNA and its expression in				
RT	E. coli.;"				
RL	Nucleic Acids Res. 11:4307-4323(1983).				
RN	[5]				
RP	SEQUENCE FROM N.A.				
RC	SPECIES=Human;				
RX	MEDLINE=84170356; PubMed=6608729;				
RA	Holbrook N.J., Smith K.A., Fornace A.J. Jr., Comeau C.M.,				
RT	"T-cell growth factor: complete nucleotide sequence and organization				
RT	of the gene in normal and malignant cells.;"				

RL Proc. Natl. Acad. Sci. U.S.A. 81:1634-1638(1984).
 RN [6]
 RP SEQUENCE FROM N.A.
 RC SPECIES=Human;
 RX MEDLINE=84170243; PubMed=6324170;
 RA Fujita T., Takaoka C., Matsui H., Taniguchi T.;
 RT "Structure of the human interleukin 2 gene.";
 RL Proc. Natl. Acad. Sci. U.S.A. 80:7437-7441(1983).
 RN [7]
 RP SEQUENCE FROM N.A.
 RC SPECIES=Human;
 RX MEDLINE=95239150; PubMed=7722480;
 RA Eisenberg O., Faber-Duman A., Lotan M., Schwartz M.;
 RT "Interleukin-2 transcripts in human and rodent brains: possible
 expression by astrocytes.";
 RL J. Neurochem. 64:1928-1936(1995).
 RN [8]
 RP SEQUENCE FROM N.A.
 RC SPECIES=Human;
 RX MEDLINE=96422299; PubMed=8824916;
 RA Chernicky C.L., Tan H., Burfeind P., Ilan J., Ilan J.;
 RT "Sequence of interleukin-2 isolated from human placental poly A+ RNA:
 possible role in maintenance of fetal allograft.";
 RL Mol. Reprod. Dev. 43:180-186(1996).
 RN [9]
 RP SEQUENCE OF 21-153 FROM N.A.
 RC SPECIES=Human;
 RX MEDLINE=89062420; PubMed=3264184;
 RA Weir M.P., Chaplin M.A., Wallace D.M., Dykes C.W., Hobden A.N.;
 RT "Structure-activity relationships of recombinant human interleukin
 2.";
 RL Biochemistry 27:6883-6892(1988).
 RN [10]
 RP SEQUENCE OF 1-69 FROM N.A.
 RC SPECIES=Human;
 RX MEDLINE=87064618; PubMed=3491296;
 RA Siebenlist U., Durand D.B., Bressler P., Holbrook N.J., Norris C.A.,
 RA Kamoun M., Kant J.A., Crabtree G.R.;
 RT "Promoter region of interleukin-2 gene undergoes chromatin structure
 changes and confers inducibility on chloramphenicol acetyltransferase
 gene during activation of T cells.";
 RL Mol. Cell. Biol. 6:3042-3049(1986).
 RN [11]
 RP SEQUENCE OF 1-68 FROM N.A.
 RC SPECIES=Human;
 RX Nishino N., Obaru K., Maeda S., Shimada K., Onoue K.;
 RT "Organization of the DNA regions flanking the human interleukin 2
 gene.";
 RL Biomed. Res. 6:197-205(1985).
 RN [12]
 RP SEQUENCE OF 21-153, DISULFIDE BOND, AND CARBOHYDRATE-LINKAGE SITE.
 RC SPECIES=Human;
 RX MEDLINE=85038540; PubMed=6333684;
 RA Robb R.J., Kutny R.M., Panico M., Morris H.R., Chowdhry V.;
 RT "Amino acid sequence and post-translational modification of human
 interleukin 2.";
 RL Proc. Natl. Acad. Sci. U.S.A. 81:6486-6490(1984).
 RN [13]
 RP CARBOHYDRATE-LINKAGE SITE.
 RC SPECIES=Human;
 RX MEDLINE=90008901; PubMed=2793860;
 RA Conrad H.S., Nimitz M., Dittmar K.E.J., Lindenmaier W., Hoppe J.,
 RA Hauser H.;
 RT "Expression of human interleukin-2 in recombinant baby hamster
 kidney, Itk-, and Chinese hamster ovary cells. Structure of O-linked
 carbohydrate chains and their location within the polypeptide.";
 RL J. Biol. Chem. 264:17368-17373(1989).
 RN [14]
 RP SEQUENCE FROM N.A.
 RC SPECIES=H.lar;
 RX MEDLINE=86042650; PubMed=3877307;
 RA Chen S.J., Holbrook N.J., Mitchell K.F., Vallone C.A.,
 RA Greengard J.S., Crabtree G.R., Lin Y.;

RT "A viral long terminal repeat in the interleukin 2 gene of a cell
 line that constitutively produces interleukin 2.";
 RL Proc. Natl. Acad. Sci. U.S.A. 82:7284-7288(1985).
 RN [15]
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).
 RC SPECIES=Human;
 RX MEDLINE=88070646; PubMed=3500515;
 RA Brandhuber B.J., Boone T., Kenney W.C., McKay D.B.;
 RT "Three-dimensional structure of interleukin-2.";
 RL Science 238:1707-1709(1987).
 RN [16]
 RP X-RAY CRYSTALLOGRAPHY.
 RX MEDLINE=92335891; PubMed=1631562;
 RA Bazan J.F.;
 RT "Unravelling the structure of IL-2.";
 RL Science 257:410-412(1992).
 RN [17]
 RP RESPONSE TO ABOVE LETTER.
 RA McKay D.B.;
 RL Science 257:412-413(1992).
 RN [18]
 RP STRUCTURE BY NMR.
 RX MEDLINE=92379010; PubMed=1510960;
 RA Mott H.R., Driscoll P.C., Boyd J., Cooke R.M., Weir M.P.,
 RA Campbell I.D.;
 RT "Secondary structure of human interleukin 2 from 3D heteronuclear NMR
 experiments.";
 RL Biochemistry 31:7741-7744(1992).
 RN [19]
 RP 3D-STRUCTURE MODELING.
 RX MEDLINE=95111955; PubMed=7529123;
 RA Bamorough P., Hedgecock C.J., Richards W.G.;
 RT "The interleukin-2 and interleukin-4 receptors studied by molecular
 modelling.";
 RL Structure 2:839-851(1994).
 CC -!- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
 MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
 PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
 IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
 ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS.
 CC -!- SUBCELLULAR LOCATION: Secreted.
 CC -!- DISEASE: A FORM OF T-CELL ACUTE LYMPHOBLASTIC LEUKEMIA (T-ALL) IS
 CHARACTERIZED BY A CHROMOSOMAL TRANSLOCATION T(4;16)(Q26;P13)
 WHICH INVOLVES IL2 AND BCMA.
 CC -!- PHARMACEUTICAL: Available under the name Proleukin (Chiron). Used
 in patients with renal cell carcinoma or metastatic melanoma.
 CC -!- SIMILARITY: BELONGS TO THE IL-2 FAMILY.
 CC -!- DATABASE: NAME-RED Systems' cytokine source book: IL2;
 WWW="http://www.fndsystems.com/asp/g_sitebuilder.asp?bodyId=206".

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 CC EMBL: J00264; AAD48509.1; -
 DR EMBL: X01586; CAA25742.1; -
 DR EMBL: V00564; CAA23827.1; -
 DR EMBL: X00695; CAA25292.1; -
 DR EMBL: K02056; AAA98792.1; -
 DR EMBL: M13879; AAA59141.1; -
 DR EMBL: K03174; AAA35453.1; -
 DR EMBL: S77834; AAD14263.2; -
 DR EMBL: S82692; AAB46883.1; -
 DR EMBL: M22005; AAA59140.1; ALT_INIT.
 DR EMBL: M11144; AAA35454.1; -
 DR EMBL: M33199; AAA59139.1; -
 DR EMBL: A14844; CAA01199.1; -
 DR PIR: A01849; ICHU2.
 DR PIR: A94067; ICGI2.

Query Match 100.0%; Score 147; DB 1; Length 153;
Best Local Similarity 100.0%; Pred. No. 2.5e-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
|||||
Db 21 APTSSSTKKTQLEHLLDLQMLNGINN 50

RESULT 2

IL2_MACFA STANDARD; PRT; 154 AA.
AC Q29615;
DT 01-NOV-1997 (Rel. 35, Created)
DT 01-NOV-1997 (Rel. 35, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
GN IL2.
OS Macaca fascicularis (Crab eating macaque) (Cynomolgus monkey).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Cercopithecoidea;
OC Cercopithecinae; Macaca.
OX NCBI_TaxID=9541;
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=Peripheral blood;
RA Yabe M., Matsura Y., Tatsumi M.;
RL Submitted (JUL-1995) to the EMBL/GenBank/DBJ databases.
CC -!- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
CC MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
CC PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
CC IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
CC ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS (BY
CC SIMILARITY).
CC -!- SUBCELLULAR LOCATION: Secreted.
CC -!- SIMILARITY: BELONGS TO THE IL-2 FAMILY.

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DR EMBL; D63352; BAA09676.1; -;
DR HSP; P01585; 31NK.
DR InterPro; IPR000779; Interleukin-2.
DR Pfam; PF00715; IL2; 1.
DR PRINTS; PR00265; INTERLEUKIN2.
DR PRODOM; PD003649; Interleukin-2; 1.
DR SMART; SM00189; IL2; 1.
DR PROSITE; PS00424; INTERLEUKIN_2; 1.
KW Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
T-cell.
FT SIGNAL 1 20 BY SIMILARITY.
FT CHAIN 21 154 INTERLEUKIN-2.
FT CARBOHYD 23 23 O-LINKED (GALNAC. . .) (BY SIMILARITY).
FT DISULFID 78 126 BY SIMILARITY.
SQ SEQUENCE 154 AA; 17686 MW; 7853FE624A5B4A49 CRC64;

Query Match 100.0%; Score 147; DB 1; Length 154;
Best Local Similarity 100.0%; Pred. No. 2.5e-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
|||||
Db 21 APTSSSTKKTQLEHLLDLQMLNGINN 50

RESULT 3

IL2_MACMU

IL2_MACMU STANDARD; PRT; 154 AA.
P51498;
DT 01-OCT-1996 (Rel. 34, Created)
DT 01-OCT-1996 (Rel. 34, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
GN IL2.
OS Macaca mulatta (Rhesus macaque), and
OS Macaca nemestrina (Pig-tailed macaque).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Cercopithecoidea;
OC Cercopithecinae; Macaca.
OX NCBI_TaxID=9544, 9545;
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=Blood;
RA MEDLINE-96003435; PubMed-7561102;
RA Villinger F.J., Brar S.S., Mayne A.E., Chikkala N., Ansari A.A.;
RT "Comparative sequence analysis of cytokine genes from human and
RT nonhuman primates."
RL J. Immunol. 155:3946-3954(1995).
CC -!- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
CC MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
CC PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
CC IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
CC ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS (BY
CC SIMILARITY).
CC -!- SUBCELLULAR LOCATION: Secreted.
CC -!- SIMILARITY: BELONGS TO THE IL-2 FAMILY.

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DR EMBL; U19847; AAB60400.1; -;
DR EMBL; U19852; AAB6714.1; -;
DR HSP; P01585; 31NK.
DR InterPro; IPR000779; Interleukin-2.
DR Pfam; PF00715; IL2; 1.
DR PRINTS; PR00265; INTERLEUKIN2.
DR PRODOM; PD003649; Interleukin-2; 1.
DR SMART; SM00189; IL2; 1.
DR PROSITE; PS00424; INTERLEUKIN_2; 1.
KW Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
T-cell.

FT SIGNAL 1 20 BY SIMILARITY.
FT CHAIN 21 154 INTERLEUKIN-2.
FT CARBOHYD 23 23 O-LINKED (GALNAC. . .) (BY SIMILARITY).
FT DISULFID 78 126 BY SIMILARITY.
SQ SEQUENCE 154 AA; 17685 MW; 6AEB480F204BA49 CRC64;

Query Match 100.0%; Score 147; DB 1; Length 154;
Best Local Similarity 100.0%; Pred. No. 2.5e-15;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
|||||
Db 21 APTSSSTKKTQLEHLLDLQMLNGINN 50

RESULT 4
IL2_CERTO STANDARD; PRT; 154 AA.
AC P46649;
DT 01-NOV-1995 (Rel. 32, Created)
DT 01-NOV-1995 (Rel. 32, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
GN IL2.


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CC -|- SUBCELLULAR LOCATION: Secreted.
CC -|- SIMILARITY: BELONGS TO THE IL-2 FAMILY.
CC -----
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CC -----
DR EMBL; L19402; AAA02865.1; -.
DR EMBL; L25408; AAA51431.1; -.
DR PIR; JN0698; JN0698.
DR HSP; P01585; 3INK.
DR InterPro; IPR000779; Interleukin-2.
DR Pfam; PF00715; IL2; 1.
DR PRINTS; PR00265; INTERLEUKIN2.
DR ProDom; PD003649; Interleukin-2; 1.
DR SMART; SM00189; IL2; 1.
DR PROSITE; PS00424; INTERLEUKIN_2; 1.
DR Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
KW T-cell.
SQ SEQUENCE 154 AA; 17653 MW; 2E71E3BD8B9665EF CRC64;

Query Match 77.6%; Score 114; DB 1; Length 154;
Best Local Similarity 73.3%; Pred. No. 2.6e-10;
Matches 22; Conservative 5; Mismatches 3; Indels 0; Gaps 0;

Qy 1 APTSSSTKKTQLEHLLLDLQMLNGINN 30
Db 21 APASSTKTEQOOLEQLLDLQLLLGVNN 50

RESULT 7
IL2_CANFA
ID IL2_CANFA STANDARD; PRT; 155 AA.
AC Q29416; Q28249;
DT 15-JUL-1998 (Rel. 36, Created)
DT 15-JUL-1998 (Rel. 36, Last sequence update)
DT 30-MAY-2000 (Rel. 39, Last annotation update)
DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
GN IL2.
OS Canis familiaris (Dog).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Carnivora; Fissipedia; Canidae; Canis.
OX NCBI_TaxID=9615;
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN=XBRED21/12/93; TISSUE=Lymph node;
RX MEDLINE=95337423; PubMed=7612930;
RA Dunham S.P., Argyle D.J., Onions D.E.;
RT "The isolation and sequence of canine interleukin-2.";
RL DNA Seq. 5:177-180(1995).
RN [2]
RP SEQUENCE FROM N.A.
RC MEDLINE=96016696; PubMed=8571541;
RA Sonberg R.L., Pullen R.P., Casal M.L., Patterson D.F., Felsburg P.J.,
RA Henthorn F.S.;
RT "A single nucleotide insertion in the canine interleukin-2 receptor
RT gamma chain results in x-linked severe combined immunodeficiency
RT disease.";
RL Vet. Immunol. Immunopathol. 47:203-213(1995).
RN [3]
RP SEQUENCE FROM N.A.
RC STRAIN=BEAGLE; TISSUE=Spleen;
RX MEDLINE=95347614; PubMed=7622066;

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RA Knapp D.W., Williams J.S., Andrisani O.M.;
RT "Cloning of the canine interleukin-2-encoding cDNA.";
RL Gene 159:281-282(1995).
CC -|- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
CC MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
CC PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
CC IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
CC ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS.
CC -|- SUBCELLULAR LOCATION: Secreted.
CC -|- SIMILARITY: BELONGS TO THE IL-2 FAMILY.
CC -----
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CC -----
DR EMBL; D30710; BAA06378.1; -.
DR EMBL; U28141; AAA68969.1; -.
DR EMBL; U11689; AAA75360.1; -.
DR HSP; P01585; 3INK.
DR InterPro; IPR000779; Interleukin-2.
DR Pfam; PF00715; IL2; 1.
DR PRINTS; PR00265; INTERLEUKIN2.
DR ProDom; PD003649; Interleukin-2; 1.
DR SMART; SM00189; IL2; 1.
DR PROSITE; PS00424; INTERLEUKIN_2; 1.
DR Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
KW T-cell.
SQ SEQUENCE 155 AA; 17668 MW; DL23E486B7F4ACID CRC64;

Query Match 73.1%; Score 107.5; DB 1; Length 155;
Best Local Similarity 71.0%; Pred. No. 2.6e-09;
Matches 22; Conservative 6; Mismatches 2; Indels 1; Gaps 1;

Qy 1 AP-TSSSTKKTQLEHLLLDLQMLNGINN 30
Db 21 APITSSSTKETEQQMEQLLDLQLLLGVNN 51

RESULT 8
IL2_RABIT
ID IL2_RABIT STANDARD; PRT; 153 AA.
AC O77620;
DT 15-JUL-1999 (Rel. 38, Created)
DT 15-JUL-1999 (Rel. 38, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
GN IL2.
OS Oryctolagus cuniculus (Rabbit).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.
OX NCBI_TaxID=9986;
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=Lymph node;
RA Kerr P.J., Lei S., Hardy C., Perkins H.D.;
RT "Complete cDNA sequence of rabbit interleukin-2.";
RL Submitted (MAY-1998) to the EMBL/GenBank/DBJ databases.
CC -|- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
CC MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
CC PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE

```


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CC -----
 DR EMBL: X56750; CAA40071.1; -;
 DR EMBL: X58428; CAA41330.1; -;
 DR EMBL: AB041935; BAB16110.1; -;
 DR PIR: S15473; S15473.
 DR PIR: S16241; S16241.
 DR HSSP: P01585; 3INK.
 DR InterPro: IPR000779; Interleukin-2.
 DR Pfam: PF00715; IL2; 1.
 DR PRINTS: PR00265; INTERLEUKIN2.
 DR ProDom: PD003649; Interleukin-2; 1.
 DR SMART: SM00189; IL2; 1.
 DR PROSITE: PS00424; INTERLEUKIN_2; 1.
 DR Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
 KW T-cell.
 FT SIGNAL 1 20 BY SIMILARITY.
 FT CHAIN 21 134 INTERLEUKIN-2.
 FT CARBOHYD 23 23 O-LINKED (GALNAc. . .) (BY SIMILARITY).
 FT DISULFID 78 126 BY SIMILARITY.
 SQ SEQUENCE 154 AA; 17401 MW; F3B95E43D4A3D3E1 CRC64;

Query Match 65.3%; Score 96; DB 1; Length 154;
 Best Local Similarity 66.7%; Pred. No. 1.5e-07;
 Matches 20; Conservative 4; Mismatches 6; Indels 0; Gaps 0;

OY 1 APTSSSTKTKTQLQLEHLLDLQMLINGINN 30
 ||||| I: ||| |||||: |||
 DB 21 APTSSSTKTKKQLEPLLLDLQLLKEVKN 50

RESULT 11
 IL2_MERUN
 ID IL2_MERUN STANDARD; PRT; 155 AA.
 AC Q08081;
 DT 01-OCT-1994 (Rel. 30, Created)
 DT 01-OCT-1994 (Rel. 30, Last sequence update)
 DT 16-OCT-2001 (Rel. 40, Last annotation update)
 DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
 GN IL2.
 OS Meriones unguiculatus (Mongolian jird).
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
 CC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Gerbillinae;
 CC Meriones.
 CC NCBI_TaxID=10047;
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE=Splice;
 RA MEDLINE=94174702; PubMed=8128610;
 RX Mai Z., Kousoulas K.G., Horohov D.W., Klei T.R.;
 FT "Cross-species PCR cloning of gerbil (Meriones unguiculatus)
 Interleukin-2 cDNA and its expression in COS-7 cells.";
 RL Vet. Immunol. Immunopathol. 40:63-71(1994).
 CC -!- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
 CC MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
 CC PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
 CC IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
 CC ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS.
 CC -!- SUBCELLULAR LOCATION: Secreted.
 CC -!- SIMILARITY: BELONGS TO THE IL-2 FAMILY.

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CC EMBL: X68779; CAA48679.1; -;
 DR PIR: S33509; S33509.
 DR HSSP: P01585; 3INK.

DR InterPro: IPR000779; Interleukin-2.
 DR Pfam: PF00715; IL2; 1.
 DR PRINTS: PR00265; INTERLEUKIN2.
 DR ProDom: PD003649; Interleukin-2; 1.
 DR SMART: SM00189; IL2; 1.
 DR PROSITE: PS00424; INTERLEUKIN_2; 1.
 DR Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
 KW T-cell.
 FT SIGNAL 1 20 BY SIMILARITY.
 FT CHAIN 21 155 INTERLEUKIN-2.
 FT CARBOHYD 23 23 O-LINKED (GALNAc. . .) (BY SIMILARITY).
 FT DISULFID 78 126 BY SIMILARITY.
 SQ SEQUENCE 155 AA; 17602 MW; D0F74AA1A381CDDA CRC64;

Query Match 64.6%; Score 95; DB 1; Length 155;
 Best Local Similarity 66.7%; Pred. No. 2.1e-07;
 Matches 20; Conservative 2; Mismatches 8; Indels 0; Gaps 0;

OY 1 APTSSSTKTKTQLQLEHLLDLQMLINGINN 30
 ||||| I: ||| |||||: |||
 DB 21 APTSSPAKEAQYLEQLLLDLQLLRGINN 50

RESULT 12
 IL2_HORSE
 ID IL2_HORSE STANDARD; PRT; 149 AA.
 AC P37997;
 DT 01-OCT-1994 (Rel. 30, Created)
 DT 01-NOV-1995 (Rel. 32, Last sequence update)
 DT 16-OCT-2001 (Rel. 40, Last annotation update)
 DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
 GN IL2.
 OS Equus caballus (Horse).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 CC Mammalia; Eutheria; Perissodactyla; Equidae; Equus.
 CC NCBI_TaxID=9796;
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE=94160538; PubMed=8116217;
 RA Vandergriff E.V., Horohov D.W.;
 RT "Molecular cloning and expression of equine Interleukin 2.";
 RL Vet. Immunol. Immunopathol. 39:395-406(1993).
 RN [2]

CC SEQUENCE FROM N.A.
 CC Tavernor A.S., Allen W.R., Butcher G.W.;
 CC Submitted (NOV-1992) to the EMBL/GenBank/DBJ databases.
 CC -!- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
 CC MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
 CC PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
 CC IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
 CC ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS.
 CC -!- SUBCELLULAR LOCATION: Secreted.
 CC -!- SIMILARITY: BELONGS TO THE IL-2 FAMILY.

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CC EMBL: L06009; AAA20134.1; -;
 DR EMBL: X69393; CAA49190.1; -;
 DR PIR: S31391; S31391.
 DR HSSP: P01585; 3INK.
 DR InterPro: IPR000779; Interleukin-2.
 DR Pfam: PF00715; IL2; 1.
 DR PRINTS: PR00265; INTERLEUKIN2.
 DR ProDom: PD003649; Interleukin-2; 1.
 DR SMART: SM00189; IL2; 1.
 DR PROSITE: PS00424; INTERLEUKIN_2; 1.
 DR Cytokine; Glycoprotein; Immune response; Signal; Growth factor;

```
KW T-cell.
FT SIGNAL 1 20 BY SIMILARITY.
FT CHAIN 21 149 INTERLEUKIN-2.
FT DISULFID 78 121 BY SIMILARITY.
FT CARBOHYD 23 23 O-LINKED (GALNAC. . .) (BY SIMILARITY).
FT CARBOHYD 106 106 N-LINKED (GALNAC. . .) (POTENTIAL).
FT CONFLICT 3 3 R -> K (IN REF. 2).
FT CONFLICT 8 8 S -> A (IN REF. 2).
FT CONFLICT 59 59 I -> M (IN REF. 2).
FT CONFLICT 125 125 N -> D (IN REF. 2).
FT CONFLICT 128 128 E -> G (IN REF. 2).
FT CONFLICT 145 145 I -> F (IN REF. 2).
FT CONFLICT 148 148 L -> M (IN REF. 2).
SQ SEQUENCE 149 AA; 17086 MW; 051BB8C47A0114FC CRC64;

Query Match 62.6%; Score 92; DB 1; Length 149;
Best Local Similarity 56.7%; Pred. No. 5.7e-07;
Matches 17; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLOLEHLLDLQMLNGINN 30
    ||||| :|| | : ||::| |::|
DB 21 APTSSSKRETQQLKQLOMDLKLLLEGVNN 50

RESULT 13
IL2_ORCOR
ID IL2_ORCOR STANDARD; PRT; 152 AA.
AC 097513;
DT 30-MAY-2000 (Rel. 39, Created)
DT 30-MAY-2000 (Rel. 39, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF) (Fragment).
GN Orcinus orca (killer whale).
OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Cetacea; Odontoceti; Delphinidae;
OC Orcinus.
OX NCBI_TaxID=9733;
RN [1]
RP SEQUENCE FROM N.A.
RA Ness T.L., Bradley W.G., Reynolds J.E. III, Reess W.B.;
RT "Isolation and expression of the interleukin-2 gene from the killer
  whale, Orcinus orca."
RL Mar. Mamm. Sci. 14:531-543(1998).
CC -1- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
  MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
  PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
  IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
  ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS (BY
  SIMILARITY).
CC -1- SUBCELLULAR LOCATION: Secreted.
CC -1- SIMILARITY: BELONGS TO THE IL-2 FAMILY.
CC
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CC
CC EMBL; AF009570; AAB01426.1; -.
CC HSSP; P01585; 1IRL.
CC InterPro; IPR000779; Interleukin-2.
CC Pfam; PF00715; IL2; 1.
CC PRINTS; PR00265; INTERLEUKIN2.
CC ProDom; PD003649; Interleukin-2; 1.
CC SMART; SM00189; IL2; 1.
CC PROSITE; PS00424; INTERLEUKIN_2; 1.
KW Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
KW T-cell.
FT SIGNAL 1 20 BY SIMILARITY.
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FT CHAIN 21 >152 INTERLEUKIN-2.
FT CARBOHYD 23 23 O-LINKED (GALNAC. . .) (BY SIMILARITY).
FT DISULFID 78 126 BY SIMILARITY.
FT NON_TER 152 152
SQ SEQUENCE 152 AA; 308F91821ECCB764 CRC64;

Query Match 59.9%; Score 88; DB 1; Length 152;
Best Local Similarity 60.0%; Pred. No. 2.4e-06;
Matches 18; Conservative 6; Mismatches 6; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLOLEHLLDLQMLNGINN 30
    ||||| :|| | : ||::| |::|
DB 21 APTSSSTENTKKQVQSLQDLQLLKEINN 50

RESULT 14
IL2_BOVIN
ID IL2_BOVIN STANDARD; PRT; 155 AA.
AC P05016;
DT 13-AUG-1987 (Rel. 05, Created)
DT 13-AUG-1987 (Rel. 05, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
GN IL2 OR IL-2.
OS Bos taurus (Bovine).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC Bovidae; Bovinae; Bos.
OX NCBI_TaxID=9913;
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE=86205869; Pubmed=3517854;
RA Cerratti D.P., McKereghan K., Larsen A., Cantrell M.A., Anderson D.,
  Gillis S., Cosman D., Baker P.E.;
RT "Cloning, sequence, and expression of bovine interleukin 2."
RL Proc. Natl. Acad. Sci. U.S.A. 83:3223-3227(1986).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE=86205870; Pubmed=3486415;
RA Reeves R., Spies A.G., Nissen M.S., Buck C.D., Weinberg A.D.,
  Barr P.J., Magnuson N.S., Magnuson J.A.;
RT "Molecular cloning of a functional bovine interleukin 2 cDNA."
RL Proc. Natl. Acad. Sci. U.S.A. 83:3228-3232(1986).
RN [3]
RP SEQUENCE OF 1-22 FROM N.A.
RC TISSUE=Thymus;
RA Anikeeva N.N., Vinogradova T.V., Votoshin O.N.;
RL Submitted (DEC-1989) to the EMBL/GenBank/DBJ databases.
CC -1- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
  MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
  PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
  IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
  ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS.
CC -1- SUBCELLULAR LOCATION: Secreted.
CC -1- SIMILARITY: BELONGS TO THE IL-2 FAMILY.
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CC
CC EMBL; M12791; AAA30586.1; -.
CC EMBL; M13204; AAA21143.1; ALT_INIT.
CC EMBL; X17201; CAA35062.1; -.
CC EMBL; X52687; CAA36912.1; -.
CC HSSP; P01585; 3INK.
CC InterPro; IPR000779; Interleukin-2.
CC Pfam; PF00715; IL2; 1.
CC PRINTS; PR00265; INTERLEUKIN2.
CC ProDom; PD003649; Interleukin-2; 1.
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DR SMART; SM00189; IL2; 1.
KW PROSITE; PS00424; INTERLEUKIN_2; 1.
KW Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
KW T-cell.
FT SIGNAL 1 20
FT CHAIN 21 155
FT DISULFID 79 127
FT CARBOHYD 23 23
FT CONFLICT 66 66
FT SEQUENCE 155 AA; 17627 MW; 816667DFA052EDF CRC64;
Query Match 53.7%; Score 79; DB 1; Length 155;
Best Local Similarity 53.3%; Pred. No. 5.7e-05;
Matches 16; Conservative 6; Mismatches 8; Indels 0; Gaps 0;
QY 1 APTSSSTKKTKTQLEHLLDLQMLNGINN 30
DB 21 APTSSSTGNTMKVKSLLDLQLLEKVRN 50
RESULT 15
IL2_CAPHI
ID IL2_CAPHI STANDARD; PRT; 155 AA.
AC P36835; P79156;
DT 01-JUN-1994 (Rel. 29, Created)
DT 01-JUN-1994 (Rel. 29, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Interleukin-2 precursor (IL-2) (T-cell growth factor) (TCGF).
GN IL2.
OS Capra hircus (Goat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC Bovidae; Caprinae; Capra.
OX NCBI_TaxID=9925;
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=Blood;
RA Rimstad E.;
RL Submitted (NOV-1993) to the EMBL/GenBank/DBJ databases.
RN [2]
RP SEQUENCE FROM N.A.
RA Beyer J.C.; Cheevers W.P.;
RL Submitted (DEC-1996) to the EMBL/GenBank/DBJ databases.
CC -!- FUNCTION: PRODUCED BY T-CELLS IN RESPONSE TO ANTIGENIC OR
CC MITOGENIC STIMULATION, THIS PROTEIN IS REQUIRED FOR T-CELL
CC PROLIFERATION AND OTHER ACTIVITIES CRUCIAL TO REGULATION OF THE
CC IMMUNE RESPONSE. CAN STIMULATE B CELLS, MONOCYTES, LYMPHOKINE-
CC ACTIVATED KILLER CELLS, NATURAL KILLER CELLS, AND GLIOMA CELLS.
CC -!- SUBCELLULAR LOCATION: Secreted.
CC -!- SIMILARITY: BELONGS TO THE IL-2 FAMILY.
CC -----
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CC or send an email to license@isb-sib.ch).
CC -----
CC EMBL; X75063; CAA53664.1; -.
CC EMBL; U34274; AAB38527.1; -.
CC PIR; S38662; S38662.
CC HSSP; P01585; 3INK.
CC InterPro; IPR000779; Interleukin-2.
CC Pfam; PF00715; IL2; 1.
CC PRINTS; PR00265; INTERLEUKIN2.
CC ProDom; PD003649; Interleukin-2; 1.
CC SMART; SM00189; IL2; 1.
CC PROSITE; PS00424; INTERLEUKIN_2; 1.
KW Cytokine; Glycoprotein; Immune response; Signal; Growth factor;
KW T-cell.
FT SIGNAL 1 20
FT CHAIN 21 155
FT BY SIMILARITY.
FT INTERLEUKIN-2.

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FT CARBOHYD 23 23
FT DISULFID 79 127
FT CONFLICT 3 5
FT CONFLICT 22 22
FT CONFLICT 30 30
FT CONFLICT 51 51
FT CONFLICT 71 71
FT CONFLICT 89 89
FT CONFLICT 99 99
FT CONFLICT 107 113
FT CONFLICT 140 140
FT CONFLICT 144 144
FT CONFLICT 154 154
FT SEQUENCE 155 AA; 17703 MW; 90022DFB6AF78DE CRC64;
O-LINKED (GALNAC... ) (BY SIMILARITY).
BY SIMILARITY.
RMQ -> QIP (IN REF. 2).
P -> T (IN REF. 2).
T -> P (IN REF. 2).
L -> P (IN REF. 2).
D -> A (IN REF. 2).
D -> E (IN REF. 2).
R -> L (IN REF. 2).
YMASLKG -> SMDNIKR (IN REF. 2).
Q -> L (IN REF. 2).
T -> I (IN REF. 2).
L -> M (IN REF. 2).
Query Match 53.7%; Score 79; DB 1; Length 155;
Best Local Similarity 53.3%; Pred. No. 5.7e-05;
Matches 16; Conservative 6; Mismatches 8; Indels 0; Gaps 0;
QY 1 APTSSSTKKTKTQLEHLLDLQMLNGINN 30
DB 21 APTSSSTGNTMKVKSLLDLQLLEKVRN 50

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Search completed: October 21, 2002, 09:49:03
Job time : 12 secs

GenCore version 5.1.3
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OM protein - protein search, using sw model

Run on: October 21, 2002, 09:47:56 ; Search time 16 Seconds

(without alignments)
180.168 Million cell updates/sec

Title: US-09-720-828A-4

Perfect score: 147

Sequence: 1 APTSSSTKKTQLQLEHLILDQLMILGNN 30

Scoring table: BLOSUM62

Gapop 10.0 , Gapext 0.5

Searched: 283138 seqs, 96089334 residues

Total number of hits satisfying chosen parameters: 283138

Minimum DB seq length: 0

Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%

Maximum Match 100%

Listing first 45 summaries

Database :

PIR_71: *
1: pir1: *
2: pir2: *
3: pir3: *
4: pir4: *

Prod. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	DB ID	Description
1	147	100.0	153	1 ICHU2	interleukin-2 prec
2	147	100.0	153	1 ICG12	interleukin-2 prec
3	114	77.6	154	2 JN0698	interleukin-2 prec
4	97	66.0	155	2 A31278	interleukin-2 prec
5	96	65.3	154	2 S16241	interleukin-2 prec
6	95	64.6	155	2 S33509	interleukin-2 - mo
7	92	62.6	149	2 S31391	interleukin-2 prec
8	79	53.7	155	2 S38662	interleukin-2 - go
9	79	53.7	155	2 S11488	interleukin-2 prec
10	79	53.7	155	2 I45913	interleukin-2 prec
11	69	46.9	169	2 S37289	interleukin-2 prec
12	64	43.5	169	1 ICM52	interleukin-2 prec
13	59.5	40.5	60	2 I68870	interleukin 2 - we
14	58.5	39.8	62	2 I54512	interleukin 2 - mo
15	57.5	39.1	72	2 I68871	interleukin 2 - mo
16	54	36.7	357	2 S12169	isopenicillin N ac
17	52	35.4	737	2 G82262	probable exopolysa
18	51	34.7	304	2 F95285	probable lysr-type
19	51	34.7	627	2 E70122	flagellar hook-ass
20	50	34.0	365	2 C70701	hypothetical prote
21	49	33.3	543	2 F82217	methyl-accepting c
22	49	33.3	1130	2 A89130	protein F52E1.4 [i
23	48.5	33.0	240	2 T22210	hypothetical prote
24	48	32.7	155	1 F64145	hypothetical prote
25	48	32.7	189	2 H64307	hypothetical prote
26	48	32.7	441	2 A13167	aminopeptidase C [
27	48	32.7	441	2 AC1736	aminopeptidase C [
28	48	32.7	1061	1 GNLJG4	pol polyprotein -
29	47.5	32.3	244	2 T11685	hypothetical prote

30 47.5 32.3 938 2 F86548 polymorphic outer
31 47.5 32.3 938 2 H72074 polymorphic membra
32 47 32.0 230 2 H82447 DNA-binding respon
33 47 32.0 398 2 H70209 conserved hypothet
34 47 32.0 557 2 F89839 hypotetical prote
35 47 32.0 1008 2 T41244 SEC14 protein homo
36 47 32.0 1964 2 A59282 nonmuscle myosin I
37 46.5 31.6 159 2 T05656 hypotetical prote
38 46.5 31.6 211 2 C84888 hypotetical prote
39 46 31.3 293 2 A71946 hypotetical prote
40 46 31.3 323 2 H50434 hypotetical prote
41 46 31.3 380 1 C37760 galactokinase (EC
42 46 31.3 516 2 B84551 oligopeptide ABC t
43 46 31.3 571 2 H82355 peptide ABC transp
44 46 31.3 614 2 T18745 hypotetical prote
45 46 31.3 692 2 T32980 hypotetical prote

ALIGNMENTS

RESULT 1

ICHU2

interleukin-2 precursor [validated] - human

N:Alternate names: IL-2; T-cell growth factor

C:Species: Homo sapiens (man)

C:Date: 11-Aug-1983 #sequence_revision 11-Aug-1983 #text_change 08-Dec-2000

C:Accession: A01849; A21192; A20961; S31209; A93297; A90113; A93478; I56518; I73624

R:Holbrook, N.J.; Lieber, M.; Crabtree, G.R.

Nucleic Acids Res. 12, 5005-5013, 1984

A:Title: DNA sequence of the 5' flanking region of the human interleukin 2 gene: ho

A:Reference number: A93524; MUID:84247353

A:Accession: A01849

A:Molecule type: DNA

A:Residues: 1-153 <HOL>

A:Cross-references: GB:X00695; GB:X00200; GB:X00201; GB:X00202; MID:g33783; PIDN:CA

R:Fujita, T.; Takaoka, C.; Matsui, H.; Taniguchi, T.

Proc. Natl. Acad. Sci. U.S.A. 80, 7437-7441, 1983

A:Title: Structure of the human interleukin 2 gene.

A:Reference number: A21192; MUID:84170243

A:Accession: A21192

A:Molecule type: DNA

A:Residues: 1-153 <FUJ>

A:Cross-references: GB:J00264; MID:g186294; PIDN:AAD48509.1; PID:g579676

R:Holbrook, N.J.; Smith, K.A.; Fornace Jr., A.J.; Comeau, C.M.; Wiskocil, R.L.; Crab

Proc. Natl. Acad. Sci. U.S.A. 81, 1634-1638, 1984

A:Title: T-cell growth factor: complete nucleotide sequence and organization of the

A:Reference number: A20961; MUID:84170356

A:Accession: A20961

A:Molecule type: DNA

A:Residues: 1-153 <HO2>

A:Cross-references: GB:K02056; MID:g186302; PIDN:AAA98792.1; PID:g386819

R:Laabi, Y.; Gras, M.P.; Carbonnel, F.; Brouet, J.C.; Berger, R.; Larsen, C.J.; Tsai

EMBO J. 11, 3897-3904, 1992

A:Title: A new gene, BCM on chromosome 16 is fused to the interleukin 2 gene by a t

A:Reference number: S31208; MUID:93010984

A:Accession: S31209

A:Molecule type: mRNA

A:Residues: 11-117 <LAA>

A:Cross-references: EMBL:Z14955

A:Note: this sequence is shown from the beginning of the fragment to the chromosomal

R:Taniguchi, T.; Matsui, H.; Fujita, T.; Takaoka, C.; Kashima, N.; Yoshimoto, R.; Ma

Nature 302, 305-310, 1983

A:Title: Structure and expression of a cloned cDNA for human interleukin-2.

A:Reference number: A93297; MUID:83167472

A:Accession: A93297

A:Molecule type: mRNA

A:Residues: 1-153 <TAN>

A:Cross-references: GB:V00564; MID:g33780; PIDN:CAA23827.1; PID:g33781

A:Experimental source: leukemic T-cell line, Jurkat-III, cloned from Jurkat-FHCRC

R:Maeda, S.; Nishino, N.; Obaru, K.; Mita, S.; Nomiya, H.; Shimada, K.; Fujimoto,

Biochem. Biophys. Res. Commun. 115, 1040-1047, 1983

A:Title: Cloning of interleukin 2 mRNAs from human tonsils.

A;Reference number: A90113; MUID:84023840
A;Accession: A90113
A;Molecule type: mRNA
A;Residues: 1-153 <NAE>
A;Cross-references: GB:J00264; NID:g186294; PIDN:AA48509.1; PID:g5729676
A;Experimental source: tonsillar mononuclear cells
R;Devos, R.; Plaetnick, G.; Cheroutre, H.; Simons, G.; Degraeve, W.; Tavernier, J.; Remau
Nucleic Acids Res. 11, 4307-4323, 1983
A;Title: Molecular cloning of human interleukin 2 cDNA and its expression in Escherichia
A;Reference number: A93478; MUID:83246551
A;Accession: A93478
A;Molecule type: mRNA
A;Residues: 1-153 <DEV>
A;Cross-references: GB:V00564; NID:g33780; PIDN:CAA23827.1; PID:g33781
A;Experimental source: splenocytes
R;Fizenberg, O.; Faber-Elman, A.; Lotan, M.; Schwartz, M.
J. Neurochem. 64, 1928-1936, 1995
A;Title: Interleukin-2 transcripts in human and rodent brains: possible expression by as
A;Reference number: I56518; MUID:95239150
A;Accession: I56518
A;Status: translated from GB/EMBL/DBJ
A;Molecule type: mRNA
A;Residues: 1-152 <EIZ>
A;Cross-references: GB:S77834; NID:g999000
A;Accession: I73624
A;Status: preliminary; translated from GB/EMBL/DBJ
A;Molecule type: mRNA
A;Residues: 577, F', 9-17, P', 19-32, X', 34-45, X', 47-143 <RES>
A;Cross-references: GB:S77835; NID:g999001; PIDN:AA14264.1; PID:g4261964
R;Nishino, N.; Obaru, K.; Maeda, S.; Shimada, K.; Onoue, K.
Biomed. Res. 6, 197-205, 1985
A;Title: Organization of the DNA regions flanking the human interleukin 2 gene.
A;Reference number: I52528
A;Accession: I52528
A;Status: translated from GB/EMBL/DBJ
A;Molecule type: DNA
A;Residues: 1-68 <REZ>
A;Cross-references: GB:M33199; NID:g186296; PIDN:AAA59139.1; PID:g553508
R;Siebenlist, U.; Durand, D.B.; Bressler, P.; Holbrook, N.J.; Norris, C.A.; Kamoun, M.;
Mol. Cell. Biol. 6, 3042-3049, 1986
A;Title: Promoter region of interleukin-2 gene undergoes chromatin structure changes and
A;Reference number: I57603; MUID:87064618
A;Accession: I57603
A;Status: translated from GB/EMBL/DBJ
A;Molecule type: DNA
A;Residues: 1-68 <RE3>
A;Cross-references: GB:M13879; NID:g186305; PIDN:AAA59141.1; PID:g553509
R;Weir, M.P.; Chaplin, M.A.; Wallace, D.M.; Dykes, C.W.; Hobden, A.N.
Biochemistry 27, 6883-6892, 1988
A;Title: Structure-activity relationships of recombinant human interleukin 2.
A;Reference number: I52401; MUID:89062420
A;Contents: recombinant IL-2 and mutants expressed in E. coli
A;Accession: I52401
A;Status: translated from GB/EMBL/DBJ
A;Molecule type: DNA
A;Residues: M', 21-153 <REX>
A;Cross-references: GB:M22005; NID:g186300; PIDN:AAA59140.1; PID:g386818
A;Note: Mutation of phe-42 to ala reduced binding to the IL-2 receptor 5-10 fold without
R;Robb, R.J.; Kutny, R.M.; Panico, M.; Morris, H.R.; Chowdhry, V.
Proc. Natl. Acad. Sci. U.S.A. 81, 6486-6490, 1984
A;Title: Amino acid sequence and post-translational modification of human interleukin 2.
A;Reference number: A94009; MUID:85038540
A;Accession: A94009
A;Molecule type: protein
A;Residues: 21-153 <ROB>
A;Note: disulfide bonds and carbohydrate binding site were determined
A;Note: heterogeneity in Jurkat-derived IL-2 is primarily due to differences in glycosyl
n in lacking 21-ala (FT-IL2-A and FT-IL2-B) and 22-pro (FT-IL2-B)
R;Conradt, H.S.; Nimitz, M.; Dittmar, K.E.J.; Lindenmeyer, W.; Hoppe, J.; Hauser, H.
J. Biol. Chem. 264, 17368-17373, 1989
A;Title: Expression of human interleukin-2 in recombinant baby hamster kidney, Ltk-, and
A;Reference number: A34463; MUID:90008901

A;Accession: A34463
A;Molecule type: protein
A;Residues: 21-35 <CON>
A;Note: the O-linked glycosylation site in recombinant material matched that from hu
R;Grabenhorst, E.; Hofer, B.; Nimitz, M.; Jaeger, V.; Conradt, H.S.
Eur. J. Biochem. 215, 189-197, 1993
A;Title: Biosynthesis and secretion of human interleukin 2 glycoproteins variants fr
A;Reference number: S34052; MUID:93345493
A;Contents: annotation; glycosylation of variant forms expressed in insect cells
C;Genetics:
A;Gene: GDB:IL2
A;Cross-references: GDB:119344; OMIM:147680
A;Map position: 4q26-q27
A;Introns: 49/3; 69/3; 117/3
C;Superfamily: interleukin-2
F;1-20/Domain: signal sequence #status predicted <SIG>
F;21-153/Product: interleukin-2 #status experimental <IL2>
F;23/Binding site: carbohydrate (Thr) (covalent) #status experimental
F;78-125/Disulfide bonds: #status experimental
Query Match 100.0%; Score 147; DB 1; Length 153;
Best Local Similarity 100.0%; Pred. No. 1.6e-14;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
Qy 1 APTSSSTKKTQLQLEHLLDLQMLANGINN 30
Db 21 APTSSSTKKTQLQLEHLLDLQMLANGINN 50
RESULT 2
ICG12
Interleukin-2 precursor - common gibbon
N;Alternate names: IL-2; T-cell growth factor
C;Species: Hyllobates lar (common gibbon, white-handed gibbon)
C;Date: 31-Dec-1991 #sequence_revision 31-Dec-1991 #text_change 22-Jun-1999
C;Accession: A94067; A01849
R;Chen, S.J.; Holbrook, N.J.; Mitchell, K.F.; Vallone, C.A.; Greengard, J.S.; Crabtr
Proc. Natl. Acad. Sci. U.S.A. 82, 7284-7288, 1985
A;Title: A viral long terminal repeat in the interleukin 2 gene of a cell line that
A;Reference number: A94067; MUID:86042650
A;Accession: A94067
A;Molecule type: mRNA
A;Residues: 1-153 <CHE>
A;Cross-references: GB:M11144; NID:g177014; PIDN:AAA35454.1; PID:g177015
A;Experimental source: leukemia cell line M1A 144; ATCC TIB 201
A;Note: the integration of a retrovirus sequence containing a 5' LTR into the 3' non
C;Superfamily: interleukin-2
C;Keywords: cytokine; glycoprotein; growth factor; immunoregulation; lymphokine; T-c
F;1-20/Domain: signal sequence #status predicted <SIG>
F;21-153/Product: interleukin-2 #status predicted <IL2>
F;23/Binding site: carbohydrate (Thr) (covalent) #status predicted
F;78-125/Disulfide bonds: #status predicted
Query Match 100.0%; Score 147; DB 1; Length 153;
Best Local Similarity 100.0%; Pred. No. 1.6e-14;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
Qy 1 APTSSSTKKTQLQLEHLLDLQMLANGINN 30
Db 21 APTSSSTKKTQLQLEHLLDLQMLANGINN 50
RESULT 3
JN0698
Interleukin 2 precursor - cat
C;Species: Felis silvestris catus (domestic cat)
C;Date: 03-Feb-1994 #sequence_revision 03-Feb-1994 #text_change 16-Jul-1999
C;Accession: JN0698
R;Corzi, P.J.; Padrid, P.A.; Takeda, J.; Alegre, M.L.; Yuhki, N.; Leff, A.R.
Biochem. Biophys. Res. Commun. 194, 1038-1043, 1993
A;Title: Sequence and functional characterization of feline interleukin 2.
A;Reference number: JN0698; MUID:93356765

A:Accession: JN0698
A:Status: nucleic acid sequence not shown
A:Molecule type: mRNA
A:Residues: 1-154 <CQ>
A:Cross-references: GB:L19402; NID:g304313; PIDN:AAA02865.1; PID:g304314
C:Superfamily: interleukin-2
C:Keywords: growth factor

Query Match 77.6%; Score 114; DB 2; Length 154;

Best Local Similarity 73.3%; Pred. No. 1.3e-09;
Matches 22; Conservative 5; Mismatches 3; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQQLQLEHLLDLQMLNGINN 30
II IIIII:II III IIIII:::II:II
DB 21 APASSSTKKTQQLQLEHLLDLQMLNGVNN 50

RESULT 4

A31278

Interleukin-2 precursor - rat

N:Alternate names: IL-2; T-cell growth factor

C:Species: Rattus norvegicus (Norway rat)

C:Date: 26-Apr-1989 #sequence_revision 26-Apr-1989 #text_change 16-Jul-1999

C:Accession: A45882; A31278

R:McKnight, A.J.; Mason, D.W.; Barclay, A.N.

Immunogenetics 30, 145-147, 1989

A:Title: Sequence of rat interleukin 2 and anomalous binding of a mouse interleukin 2 cd

A:Reference number: A45882; MUID:89339608

A:Accession: A45882

A:Status: preliminary

A:Molecule type: mRNA

A:Residues: 1-155 <MC>

A:Cross-references: GB:M22899; NID:g204909; PIDN:AAA41427.1; PID:g204910

C:Superfamily: interleukin-2

C:Keywords: cytokine; glycoprotein; growth factor; immunoregulation; T-cell

Query Match 66.0%; Score 97; DB 2; Length 155;

Best Local Similarity 66.7%; Pred. No. 4.7e-07;
Matches 20; Conservative 4; Mismatches 6; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQQLQLEHLLDLQMLNGINN 30
IIIII:II:II III IIIII:::II:II
DB 21 APTSSPAKETQQLQLEHLLDLQVLLRGIDN 50

RESULT 5

S16241

Interleukin-2 precursor - pig

N:Alternate names: IL-2; T-cell growth factor

C:Species: Sus scrofa domestica (domestic pig)

C:Date: 30-Jun-1992 #sequence_revision 30-Jun-1992 #text_change 16-Jul-1999

C:Accession: S16241; S15473

R:Goodall, J.C.; Emery, D.C.; Bailey, M.; English, L.S.; Hall, L.

Biochim. Biophys. Acta 1089, 257-258, 1991

A:Title: cDNA cloning of porcine interleukin 2 by polymerase chain reaction.

A:Reference number: S16241; MUID:91274360

A:Accession: S16241

A:Molecule type: mRNA

A:Residues: 1-154 <GO>

A:Cross-references: EMBL:X56750; NID:g1991; PIDN:CAA40071.1; PID:g1992

R:Lefevre, F.

Submitted to the EMBL Data Library, March 1991

A:Description: Molecular cloning of porcine interleukin 2 cDNA by the polymerase chain r

A:Reference number: S15473

A:Accession: S15473

A:Molecule type: mRNA

A:Residues: 1-154 <LE>

A:Cross-references: EMBL:X58428; NID:g2068; PIDN:CAA41330.1; PID:g2069

C:Superfamily: interleukin-2

C:Keywords: cytokine; glycoprotein; growth factor; immunoregulation; T-cell

F:1-20/Domain: signal sequence #status predicted <Sig>

F:21-154/Product: interleukin-2 #status predicted <MAT>

Query Match 65.3%; Score 96; DB 2; Length 154;

Best Local Similarity 66.7%; Pred. No. 6.6e-07;
Matches 20; Conservative 4; Mismatches 6; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQQLQLEHLLDLQMLNGINN 30
IIIIII:II:II III IIIII:::II:II
DB 21 APTSSSTKKTQQLQLEHLLDLQMLNGVNN 50

RESULT 6

S33509

Interleukin-2 - Mongolian jird

C:Species: Meriones unguiculatus (Mongolian jird)

C:Date: 06-Jan-1995 #sequence_revision 06-Jan-1995 #text_change 16-Jul-1999

C:Accession: S33509

R:Ma, Z.; Klei, T.; Horohov, D.

submitted to the EMBL Data Library, October 1992

A:Reference number: S33509

A:Accession: S33509

A:Status: preliminary

A:Molecule type: mRNA

A:Residues: 1-155 <MAI>

A:Cross-references: EMBL:X68779; NID:g577588; PIDN:CAA48679.1; PID:g311638

C:Superfamily: interleukin-2

Query Match 64.6%; Score 95; DB 2; Length 155;

Best Local Similarity 66.7%; Pred. No. 9.4e-07;
Matches 20; Conservative 2; Mismatches 8; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQQLQLEHLLDLQMLNGINN 30
IIIII:II:II III IIIII:::II:II
DB 21 APTSSPAKETQQLQLEHLLDLQMLNGINN 50

RESULT 7

S31391

Interleukin-2 precursor - horse

C:Species: Equus caballus (domestic horse)

C:Date: 13-Jan-1995 #sequence_revision 13-Jan-1995 #text_change 16-Jul-1999

C:Accession: S31391

R:Tavernor, A.S.; Butcher, G.W.

submitted to the EMBL Data Library, November 1992

A:Description: cDNA cloning of equine interleukin-2 by polymerase chain reaction.

A:Reference number: S31391

A:Accession: S31391

A:Status: preliminary

A:Molecule type: mRNA

A:Residues: 1-149 <TAV>

A:Cross-references: EMBL:X69393; NID:g1076; PIDN:CAA49190.1; PID:g1077

C:Superfamily: interleukin-2

Query Match 62.6%; Score 92; DB 2; Length 149;

Best Local Similarity 56.7%; Pred. No. 2.5e-06;
Matches 17; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQQLQLEHLLDLQMLNGINN 30
IIIIII:II:II III IIIII:::II:II
DB 21 APTSSSKRETQQLQLEHLLDLQMLNGVNN 50

RESULT 8

S38662

Interleukin-2 - goat

C:Species: Capra aegagrus hircus (domestic goat)

C:Date: 06-Jan-1995 #sequence_revision 06-Jan-1995 #text_change 16-Jul-1999

C:Accession: S38662

R:Kinstad, E.

submitted to the EMBL Data Library, November 1993

A:Description: The molecular cloning and expression of caprine interleukin 2.

A:Reference number: S38662

A:Accession: S38662

A:Status: preliminary

A:Molecule type: mRNA

A:Residues: 1-155 <RIM>

A:Cross-references: EMBL:X76063; NID:g416002; PIDN:CAA53664.1; PID:g416003

C:Superfamily: Interleukin-2

Query Match 53.7%; Score 79; DB 2; Length 155;

Best Local Similarity 53.3%; Pred. No. 0.00023;

Matches 16; Conservative 6; Mismatches 8; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDQLMILNGINN 30

||||| | : : : ||||| : |

Db 21 APTSSSTGNTMKVKSLLDQLLEKVKV 50

RESULT 9

S11488

Interleukin-2 precursor - sheep

C:Species: Ovis orientalis aries, Ovis ammon aries (domestic sheep)

C:Date: 21-Nov-1993 #sequence_revision 10-Nov-1995 #text_change 16-Jul-1999

C:Accession: S11488; S13102; S15517

R:Goodall, J.C.; Emery, D.C.; Perry, A.C.F.; English, L.S.; Hall, L.

Nucleic Acids Res. 18, 5883, 1990

A:Title: cDNA cloning of ovine interleukin 2 by PCR.

A:Reference number: S11488; MUID:91016933

A:Accession: S11488

A>Status: preliminary

A:Molecule type: mRNA

A:Residues: 1-155 <GOO>

A:Cross-references: EMBL:X53934; NID:g1281; PIDN:CAA37881.1; PID:g1282

R:Seow, H.F.; Rothel, J.S.; Radford, A.J.; Wood, P.R.

Nucleic Acids Res. 18, 7175, 1990

A:Title: The molecular cloning of ovine interleukin 2 gene by the polymerase chain react

A:Reference number: S13102; MUID:91088336

A:Accession: S13102

A>Status: preliminary

A:Molecule type: mRNA

A:Residues: 1-5, L', 7-155 <SEO>

A:Cross-references: EMBL:X55641; NID:g1810; PIDN:CAA39165.1; PID:g1811

R:Bujdoso, R.; Williamson, M.L.; Sargan, D.R.; Hein, W.H.; McConnell, I.

submitted to the EMBL Data Library, April 1991

A:Reference number: S15517

A:Accession: S15517

A>Status: preliminary

A:Molecule type: mRNA

A:Residues: 21-153 <BUJ>

A:Cross-references: EMBL:X60148

C:Superfamily: Interleukin-2

Query Match 53.7%; Score 79; DB 2; Length 155;

Best Local Similarity 53.3%; Pred. No. 0.00023;

Matches 16; Conservative 6; Mismatches 8; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDQLMILNGINN 30

||||| | : : : ||||| : |

Db 21 APTSSSTGNTMKVKSLLDQLLEKVKV 50

RESULT 10

I45913

Interleukin-2 precursor - bovine

C:Species: Bos primigenius taurus (cattle)

C:Date: 16-Aug-1996 #sequence_revision 16-Aug-1996 #text_change 16-Jul-1999

C:Accession: I45913; S21470; S20761

R:Cerretti, D.P.; McKereghan, K.; Larsen, A.; Cantrell, M.A.; Anderson, D.; Gillis, S.;

Proc. Natl. Acad. Sci. U.S.A. 83, 3223-3227, 1986

A:Title: Cloning, sequence, and expression of bovine interleukin 2.

A:Reference number: I45913; MUID:86205869

A:Accession: I45913

A>Status: preliminary; translated from GB/EMBL/DBJ

A:Molecule type: mRNA

A:Residues: 1-155 <CER>

A:Cross-references: GB:M12791; NID:g163204; PIDN:AAA30586.1; PID:g163205

R:Anikeeva, N.N.; Vinogradova, T.V.; Votoshin, O.N.

submitted to the EMBL Data Library, December 1989

A:Reference number: S21470

A:Accession: S21470

A:Molecule type: DNA

A:Residues: 1-22 <AN2>

A:Cross-references: EMBL:X17201; NID:g452; PIDN:CAA35062.1; PID:g453

C:Genetics:

A:Gene: IL-2

C:Superfamily: interleukin-2

C:Keywords: cytokine; glycoprotein; growth factor; immunoregulation; lymphokine; T-

Query Match 53.7%; Score 79; DB 2; Length 155;

Best Local Similarity 53.3%; Pred. No. 0.00023;

Matches 16; Conservative 6; Mismatches 8; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLEHLLDQLMILNGINN 30

||||| | : : : ||||| : |

Db 21 APTSSSTGNTMKVKSLLDQLLEKVKV 50

RESULT 11

S37289

Interleukin-2 precursor - mouse

C:Species: Mus musculus (house mouse)

C:Date: 13-Jan-1995 #sequence_revision 13-Jan-1995 #text_change 16-Jul-1999

C:Accession: S37289; S27205; S36162; S24936

R:Todd, J.A.

submitted to the EMBL Data Library, April 1993

A:Reference number: S37289

A:Accession: S37289

A>Status: preliminary

A:Molecule type: mRNA

A:Residues: 1-169 <TOD>

A:Cross-references: EMBL:X73040

R:Matesanz, F.; Alcina, A.; Belliczer, A.

Biochim. Biophys. Acta 1132, 335-336, 1992

A:Title: A new cDNA sequence for the murine interleukin-2 gene.

A:Reference number: S27205

A:Accession: S27205

A:Molecule type: mRNA

A:Residues: 1-63 <MATE>

A:Cross-references: EMBL:X66058; NID:g52725; PIDN:CAA46854.1; PID:g52726

R:Ghosh, S.; Palmer, S.M.; Rodrigues, N.R.; Cordell, H.J.; Hearne, C.M.; Cornell, R.

Nature Genet. 4, 404-409, 1993

A:Title: Polygenic control of autoimmune diabetes in nonobese diabetic mice.

A:Reference number: S36162; MUID:94004970

A:Accession: S36162

A>Status: preliminary

A:Molecule type: mRNA

A:Residues: 1-50 <GHO>

A:Cross-references: EMBL:X73040

C:Superfamily: interleukin-2

C:Keywords: cytokine; glycoprotein; growth factor; lymphokine; T-cell

F:1-20/Domain: signal sequence #status predicted <SIG>

F:21-63/Product: interleukin-2 #status predicted <SIG>

Query Match 46.9%; Score 69; DB 2; Length 169;

Best Local Similarity 47.2%; Pred. No. 0.008;

Matches 17; Conservative 6; Mismatches 7; Indels 6; Gaps 1;

QY 1 APTSSSTKKTQIQ-----LEHLLDQLMILNGINN 30

||||| | : : : ||||| : |

Db 29 SPTSSSTAEEAQQQQQQHLEQLMDQLLELRSMEN 64

RESULT 12

ICMS2

Interleukin-2 precursor - mouse

N:Alternate names: IL-2; T-cell growth factor (TCGF)

C:Species: Mus musculus (house mouse)

C:Date: 30-Jun-1987 #sequence_revision 30-Jun-1987 #text_change 21-Jul-2000

C:Accession: A93550; A54490; A94064; I48597; A01850; I84713

R:Fuse, A.; Fujita, T.; Yasumitsu, H.; Kashima, N.; Hasegawa, K.; Taniguchi, T.

Nucleic Acids Res. 12, 9323-9331, 1984
A:Title: Organization and structure of the mouse interleukin-2 gene.
A:Reference number: A93550; MUID:85087940

A:Accession: A93550
A:Molecule type: DNA

A:Residues: 1-169 <RUS>
R:Degrave, W.; Simons, G.; Devos, R.; Plaetinck, G.; Remaut, E.; Tavernier, J.; Fiers, W.

Mol. Biol. Rep. 11, 57-61, 1986
A:Title: Cloning and structure of a mouse interleukin-2 chromosomal gene.

A:Reference number: A54490; MUID:86118396
A:Accession: A54490

A:Molecule type: DNA
A:Residues: 1-169 <DEG>

A:Cross-references: GB:M16760
R:Yokota, T.; Arai, N.; Lee, F.; Rennick, D.; Mosmann, T.; Arai, K.

Proc. Natl. Acad. Sci. U.S.A. 82, 68-72, 1985
A:Title: Use of a cDNA expression vector for isolation of mouse interleukin 2 cDNA clone

A:Reference number: A94064; MUID:85113172
A:Accession: A94064

A:Molecule type: mRNA
A:Residues: 1-169 <YOK>

A:Cross-references: GB:K02292; PIDN:AAA39289.1; PID:g309404
R:Kashima, N.; Nishi-Takaoka, C.; Fujita, T.; Faki, S.; Yamada, G.; Hamuro, J.; Taniguchi

Nature 313, 402-404, 1985
A:Title: Unique structure of murine interleukin-2 as deduced from cloned cDNAs.

A:Reference number: I48597; MUID:85111148
A:Accession: I48597

A:Status: preliminary; translated from GB/EMBL/DBDJ
A:Molecule type: mRNA

A:Residues: 1-169 <RES>
A:Cross-references: EMBL:X01772; GB:K02797; NID:g52663; PIDN:CAA25909.1; PID:g758159

C:Comment: Produced by T-cells in response to antigenic or mitogenic stimulation, this p

C:Genetics:

A:Introns: 63/3; 83/3; 132/3

C:Superfamily: interleukin-2

C:Keywords: cytokine; glycoprotein; growth factor; immunoregulation; lymphokine; T-cell

F:1-20/Domain: signal sequence #status predicted <SIG>

F:21-169/Product: interleukin-2 #status predicted <WAY>

F:23/Binding site: carbohydrate (Thr) (covalent) #status predicted

F:92-140/Disulfide bonds: #status predicted

Query Match 43.5%; Score 64; DB 1; Length 169;

Best Local Similarity 38.6%; Pred. No. 0.044;

Matches 17; Conservative 6; Mismatches 7; Indels 14; Gaps 1;

QY 1 APTSSST-----KKTQLEHLLDQLQMLN 30

DB 21 APTSSSTSTAEAAQOQOQOQOQHLEQLMDLQELLSRMEN 64

RESULT 13

I68870

interleukin 2 - western wild mouse (fragment)

C:Species: Mus spretus (western wild mouse)

C:Date: 02-Aug-1996 #sequence_revision 02-Aug-1996 #text_change 16-Jul-1999

C:Accession: I68870

R:Matesanz, F.; Alcina, A.; Pellicer, A.

Immunogenetics 38, 300-303, 1993

A:Title: Existence of at least five interleukin-2 molecules in different mouse strains.

A:Reference number: I54512; MUID:93307791

A:Accession: I68870

A:Status: preliminary; translated from GB/EMBL/DBDJ

A:Molecule type: DNA

A:Residues: 1-60 <RES>

A:Cross-references: GB:L07575; NID:g349515; PIDN:AAA39327.1; PID:g349516

C:Genetics:

A:Gene: IL-2

C:Superfamily: interleukin-2

Query Match 40.5%; Score 59.5; DB 2; Length 60;

Best Local Similarity 45.5%; Pred. No. 0.064;

Matches 15; Conservative 6; Mismatches 5; Indels 7; Gaps 1;

QY 1 APTSSST-----KKTQLEHLLDQLQMLN 26

DB 25 SPTSSSTSTAEAAQOQOQOQHLEQLMDLQELLS 57

RESULT 14

I54512

interleukin 2 - mouse (fragment)

C:Species: Mus musculus (house mouse)

C:Date: 02-Aug-1996 #sequence_revision 02-Aug-1996 #text_change 16-Jul-1999

C:Accession: I54512

R:Matesanz, F.; Alcina, A.; Pellicer, A.

Immunogenetics 38, 300-303, 1993

A:Title: Existence of at least five interleukin-2 molecules in different mouse strains

A:Reference number: I54512; MUID:93307791

A:Accession: I54512

A:Status: preliminary; translated from GB/EMBL/DBDJ

A:Molecule type: DNA

A:Residues: 1-62 <RES>

A:Cross-references: GB:L07574; NID:g349513; PIDN:AAA39326.1; PID:g349514

C:Genetics:

A:Gene: IL-2

C:Superfamily: interleukin-2

Query Match 39.8%; Score 58.5; DB 2; Length 62;

Best Local Similarity 42.9%; Pred. No. 0.094;

Matches 15; Conservative 6; Mismatches 5; Indels 9; Gaps 1;

QY 1 APTSSST-----KKTQLEHLLDQLQMLN 26

DB 25 SPTSSSTSTAEAAQOQOQOQHLEQLMDLQELLS 59

RESULT 15

I68871

interleukin 2 - mouse (fragment)

C:Species: Mus musculus (house mouse)

C:Date: 02-Aug-1996 #sequence_revision 02-Aug-1996 #text_change 16-Jul-1999

C:Accession: I68871

R:Matesanz, F.; Alcina, A.; Pellicer, A.

Immunogenetics 38, 300-303, 1993

A:Title: Existence of at least five interleukin-2 molecules in different mouse strains

A:Reference number: I54512; MUID:93307791

A:Accession: I68871

A:Status: preliminary; translated from GB/EMBL/DBDJ

A:Molecule type: DNA

A:Residues: 1-72 <RES>

A:Cross-references: GB:L07576; NID:g349517; PIDN:AAA39328.1; PID:g349518

C:Genetics:

A:Gene: IL-2

C:Superfamily: interleukin-2

Query Match 39.1%; Score 57.5; DB 2; Length 72;

Best Local Similarity 35.6%; Pred. No. 0.16;

Matches 16; Conservative 5; Mismatches 5; Indels 19; Gaps 1;

QY 1 APTSSSTKKTQLEHLLDQLQMLN 26

DB 25 SPTSSSTAEAAQOQOQOQOQHLEQLMDLQELLS 69

Search completed: October 21, 2002, 09:49:58

Job time : 19 secs

GenCore version 5.1.3
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OM protein - protein search, using sw model

Run on: October 21, 2002, 09:46:41 ; Search time 30 Seconds
(without alignments)
111.074 Million cell updates/sec

Title: US-09-720-828A-4

Perfect score: 147

Sequence: 1 APTSSSTKKTQLQLHLLDLQMLNGINN 30

Scoring table: BLOSUM62

Gapop 10.0 , Gapext 0.5

Searched: 747574 seqs, 111073796 residues

Total number of hits satisfying chosen parameters: 747574

Minimum DB seq length: 0

Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%

Maximum Match 100%

Listing first 45 summaries

Database : A_Geneseq_032802.*

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22: /SIDSL1/gcgdata/geneseq/geneseq-emb1/AA2001.DAT.*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	147	100.0	30	21 AAY51598	Human IL-2 derived
2	147	100.0	31	21 AAY51597	Human IL-2 derived
3	147	100.0	58	12 AAR11015	Human Interleukin-
4	147	100.0	60	11 AAR06838	Human IL-2 N-termi
5	147	100.0	60	15 AAR48245	Human Interleukin-
6	147	100.0	88	17 AAR95433	Interleukin-2 ALPH
7	147	100.0	96	15 AAR68899	Human pro-insulin
8	147	100.0	96	16 AAR78662	Fusion protein con
9	147	100.0	120	6 AAP50864	Sequence of interl
10	147	100.0	128	12 AAR10906	Interleukin-2 muta
11	147	100.0	129	12 AAR10905	Interleukin-2 muta

12	147	100.0	129	12 AAR10908	Interleukin-2 muta
13	147	100.0	130	12 AAR10907	Interleukin-2 muta
14	147	100.0	131	4 AAP30044	Sequence of interl
15	147	100.0	131	6 AAP50217	Sequence of human
16	147	100.0	132	12 AAR10901	Interleukin-2 muta
17	147	100.0	132	12 AAR10902	Interleukin-2 muta
18	147	100.0	132	12 AAR10903	Interleukin-2 muta
19	147	100.0	132	12 AAR10904	Interleukin-2 muta
20	147	100.0	133	5 AAP40048	Sequence of an int
21	147	100.0	133	5 AAP40044	Sequence of mature
22	147	100.0	133	6 AAP50163	Sequence of the hu
23	147	100.0	133	6 AAP50857	Sequence of interl
24	147	100.0	133	6 AAP50858	Sequence of interl
25	147	100.0	133	6 AAP50859	Sequence of interl
26	147	100.0	133	6 AAP50860	Sequence of interl
27	147	100.0	133	6 AAP50861	Sequence of interl
28	147	100.0	133	6 AAP50862	Sequence of interl
29	147	100.0	133	6 AAP50863	Sequence of interl
30	147	100.0	133	7 AAP60833	Oxidation resistan
31	147	100.0	133	7 AAP60834	Oxidation resistan
32	147	100.0	133	7 AAP60835	Oxidation resistan
33	147	100.0	133	7 AAP60836	Oxidation resistan
34	147	100.0	133	7 AAP60837	Oxidation resistan
35	147	100.0	133	7 AAP60838	Oxidation resistan
36	147	100.0	133	7 AAP61100	Sequence of interl
37	147	100.0	133	7 AAP61651	Antigenic fragment
38	147	100.0	133	7 AAP61725	Plasmid pLOT135-8
39	147	100.0	133	7 AAP60220	Sequence of non-gl
40	147	100.0	133	7 AAP61783	Sequence encoded b
41	147	100.0	133	8 AAP70495	Sequence of human
42	147	100.0	133	9 AAP80128	Interleukin 2 alal
43	147	100.0	133	9 AAP80129	Interleukin 2 alal
44	147	100.0	133	10 AAP91923	Human Interleukin-
45	147	100.0	133	11 AAR00593	Recombinant human

ALIGNMENTS

RESULT 1
AAY51598
ID AAY51598 standard; Protein; 30 AA.

XX AC

XX AAY51598;

XX 25-MAY-2000 (first entry)

XX DE Human IL-2 derived peptide IPL30 #2.

XX IL-2; interleukin 2; human; IPL30; immunosuppressive; antirheumatic;
KW graft rejection; autoimmune disorder; rheumatoid arthritis.

XX OS Homo sapiens.

XX PN WO200004048-A1.

XX PD 27-JAN-2000.

XX PF 16-JUL-1999; 99WO-IB01424.

XX PR 16-JUL-1998; 98US-0116594.

XX (INSP) INST PASTEUR.

XX PI Theze J, Eckenberg R, Moreau J, Goldberg M, Rose T, Alzari P;
Mazie J;

XX DR WPI; 2000-182403/16.

XX DR N-PSDB; AAZ88838.

XX PT Novel cytokine peptides and antibody for preventing and/or treating
PT undesirable immune reactions e.g. graft rejection and autoimmune
PT disorders

XX PS Claim 1; Page 55; 56pp; English.

XX CC This invention describes a novel a peptide, IPI30 having 31 (I) or 30

XX CC (II) amino acid sequence or its homologous sequence (H) exhibiting the

XX CC same activity or binding characteristic. The products of the invention

XX CC have immunosuppressive and antirheumatic activity. (I) or (II) is used

XX CC for preparing medicament useful to induce IL-2 activity. (A) or a peptide

XX CC binding to it is used for inhibiting the activity of IL-2R in treating

XX CC conditions related with undesirable immune reactions like graft

XX CC rejection, and autoimmune disorders like rheumatoid arthritis. It is also

XX CC used for immunoadfinity purification of native or recombinant IL-2

XX CC peptides. (V) is also used for preparing medicaments in treating patients

XX CC with deficient IL-2 activity. (III) used to prepare antisense

XX CC oligonucleotides and ribozymes modulating the expression of IL-2 which

XX CC can be used in gene therapy applications. The peptides inhibits or mimics

XX CC the binding of helix A of IL-2 to a subunit of an IL-2R and thus produces

XX CC a specific interaction. This sequence represents an IPI30 peptide

XX CC described in the method of the invention.

XX SQ Sequence 30 AA;

Query Match 100.0%; Score 147; DB 21; Length 30;

Best Local Similarity 100.0%; Pred. No. 1.le-13;

Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLQLEHLLLDLQMLINGINN 30

DB 1 APTSSSTKKTQLQLEHLLLDLQMLINGINN 30

RESULT 2

AA51597

ID AAY51597 standard; Protein: 31 AA.

XX AC AAY51597;

XX DT 25-MAY-2000 (first entry)

XX DE Human IL-2 derived peptide IPI30 #1.

XX KW IL-2; interleukin 2; human; IPI30; immunosuppressive; antirheumatic;

XX KW graft rejection; autoimmune disorder; rheumatoid arthritis.

XX OS Homo sapiens.

XX PN WO200004048-A1.

XX PD 27-JAN-2000.

XX PF 16-JUL-1999; 99WO-IB01424.

XX PR 16-JUL-1998; 98US-0116594.

XX XX (INSP) INST PASTEUR.

XX PI Theze J, Eckenberg R, Moreau J, Goldberg M, Rose T, Alzari P;

XX PI Mazie J;

XX XX WPI; 2000-182403/16.

XX DR N-PSDB; AA288837.

XX XX Novel cytokine peptides and antibody for preventing and/or treating

XX PT undesirable immune reactions e.g. graft rejection and autoimmune

XX PT disorders -

XX XX Claim 1; Page 54; 56pp; English.

XX CC This invention describes a novel a peptide, IPI30 having 31 (I) or 30

XX CC (II) amino acid sequence or its homologous sequence (H) exhibiting the

XX CC same activity or binding characteristic. The products of the invention

XX CC have immunosuppressive and antirheumatic activity. (I) or (II) is used

XX CC for preparing medicament useful to induce IL-2 activity. (A) or a peptide

XX CC binding to it is used for inhibiting the activity of IL-2R in treating

XX CC conditions related with undesirable immune reactions like graft

XX CC rejection, and autoimmune disorders like rheumatoid arthritis. It is also

XX CC used for immunoadfinity purification of native or recombinant IL-2

XX CC peptides. (V) is also used for preparing medicaments in treating patients

XX CC with deficient IL-2 activity. (III) used to prepare antisense

XX CC oligonucleotides and ribozymes modulating the expression of IL-2 which

XX CC can be used in gene therapy applications. The peptides inhibits or mimics

XX CC the binding of helix A of IL-2 to a subunit of an IL-2R and thus produces

XX CC a specific interaction. This sequence represents an IPI30 peptide

XX CC described in the method of the invention.

XX SQ Sequence 31 AA;

Query Match 100.0%; Score 147; DB 21; Length 31;

Best Local Similarity 100.0%; Pred. No. 1.le-13;

Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLQLEHLLLDLQMLINGINN 30

DB 2 APTSSSTKKTQLQLEHLLLDLQMLINGINN 31

RESULT 3

AA11015

ID AAR11015 standard; Peptide; 58 AA.

XX AC AAR11015;

XX DT 13-MAY-1991 (first entry)

XX DE Human interleukin-2-derived stabiliser peptide.

XX KW Interleukin-2; IL-2; gag 24; gp 41; gp 36; HIV detection.

XX OS Homo sapiens.

XX PN EP416673-A.

XX PD 13-MAR-1991.

XX PF 02-AUG-1990; 90EP-0202108.

XX PR 03-AUG-1989; 89CU-0000149.

XX XX (INGE-) CENT ING GENETICA.

XX PI Novoa Perez LI, Machado Lahera JA, Fernandez Maso JR;

XX PI Benitez Fuentes JV, Narciandi Diaz RE, Rodriguez Reinoso JL;

XX PI Estrada Garcia MP, Garcia Suarez J, Herrera Martinez LS;

XX XX WPI; 1991-075192/11.

XX DR N-PSDB; AAQ10898.

XX XX Method for expressing heterologous proteins - as fusion protein,

XX XX using vector contg. stabilising sequence

XX PS Claim 2; Page 10; 18pp; English.

XX XX The sequence corresponds to the first 58 amino acid residues of

XX CC human IL-2. It forms part of a fusion protein, linked to a

XX CC heterologous protein. The heterologous protein is preferably gag 24

XX CC or a fragment of gp 41 of HIV-1 or it is a fragment of gp 36 of

XX CC HIV-2. Such fusion proteins can be used to detect antibodies to

XX CC these proteins. See also AAQ10899-Q10903.

XX SQ Sequence 58 AA;

Query Match 100.0%; Score 147; DB 12; Length 58;

Best Local Similarity 100.0%; Pred. No. 2.2e-13;

Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 APTSSSTKKTQLQLEHLLLDLQMLINGINN 30


```
Db      2 APTSSSTKKTQLEHLLLDLQMLNGINN 31
|||||
RESULT 4
AAR06838
ID AAR06838 standard; protein; 60 AA.
XX AC AAR06838;
XX
XX 14-JAN-1991 (first entry)
XX
DE Human IL-2 N-terminal transcript of plasmid pTl3S.
XX
KW Bovine tuberculosis; Interleukin-2; IL-2; plasmid pTl3S.
XX
OS Mycobacterium bovis.
XX
XX JP02195895-A.
XX
PD 02-AUG-1990.
XX
XX 24-JAN-1989; 89JP-0013270.
XX
XX 24-JAN-1989; 89JP-0013270.
XX
PA (AJIN ) AJINOMOTO KK.
XX
XX WPI; 1990-278851/37.
DR N-PSDB; AAQ05976.
XX
XX BCG bacteria derived immuno:protein MPB70 - can be used as
PT diagnostic agent used to determine bovine tuberculosis.
XX
XX Disclosure; Fig 2; 11pp; Japanese.
XX
CC Immunoprotein MPB 70 encoding sequence may be incorporated into
CC plasmid pTl3S with an N-terminal fragment of human IL-2. The plasmid
CC may be used to transform an expression system giving a fusion
CC protein which may be used as a diagnostic agent for bovine
CC tuberculosis infection.
XX
XX Sequence 60 AA;
SQ
Query Match 100.0%; Score 147; DB 11; Length 60;
Best Local Similarity 100.0%; Pred. No. 2.3e-13;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
QY 1 APTSSSTKKTQLEHLLLDLQMLNGINN 30
Db 2 APTSSSTKKTQLEHLLLDLQMLNGINN 31
|||||
RESULT 5
AAR48245
ID AAR48245 standard; Protein; 60 AA.
XX AC AAR48245;
XX
XX 12-JUL-1994 (first entry)
XX
DE Human Interleukin-2.
XX
KW non-coding region; coding region; resonance; interaction; IL-2;
KW optimisation; degenerate sequence; plasmid pTl3Snc; pT9-11;
KW gene expression; regulation; recombinant protein production;
KW interleukin-2; interleukin-6.
XX
OS Homo sapiens.
XX
PN FR2692594-A.
XX
PD 24-DEC-1993.
|||||
22-JUN-1992; 92FR-0007571.
22-JUN-1992; 92FR-0007571.
(PEREZ/) PEREZ J.
Perez J;
WPI: 1994-028256/04.
N-PSDB; AAQ55629, AAQ55630.
Application of optimised gene expression - for scientific,
industrial and therapeutic purposes
Disclosure; Fig 28 and Fig 29; 110pp; French.
Resonances between coding and non-coding regions were measured for
the native human IL-2 gene in plasmid pT911 (see AAQ55630) and a
synthetic IL-2 gene (AAQ55629) in which alternative, degenerate
codons were used in order to introduce additional restriction
sites. It was found that the degenerate changes greatly upset the
"natural order" between coding and non-coding regions; as a result,
the amount of protein expressed by the degenerate gene is likely to
be adversely affected. The inventors have proposed an "optimised"
IL-2 gene with the aim of increasing the amount of protein expressed
by the gene. (N.B. the sequence is also described as
interleukin-6).
```

```
XX PF 22-JUN-1992; 92FR-0007571.
XX PR 22-JUN-1992; 92FR-0007571.
XX PA (PEREZ/) PEREZ J.
XX PI Perez J;
XX DR WPI: 1994-028256/04.
XX DR N-PSDB; AAQ55629, AAQ55630.
XX PT Application of optimised gene expression - for scientific,
XX PT industrial and therapeutic purposes
XX PS Disclosure; Fig 28 and Fig 29; 110pp; French.
XX
CC Resonances between coding and non-coding regions were measured for
CC the native human IL-2 gene in plasmid pT911 (see AAQ55630) and a
CC synthetic IL-2 gene (AAQ55629) in which alternative, degenerate
CC codons were used in order to introduce additional restriction
CC sites. It was found that the degenerate changes greatly upset the
CC "natural order" between coding and non-coding regions; as a result,
CC the amount of protein expressed by the degenerate gene is likely to
CC be adversely affected. The inventors have proposed an "optimised"
CC IL-2 gene with the aim of increasing the amount of protein expressed
CC by the gene. (N.B. the sequence is also described as
CC interleukin-6).
```

```
XX SQ Sequence 60 AA;
Query Match 100.0%; Score 147; DB 15; Length 60;
Best Local Similarity 100.0%; Pred. No. 2.3e-13;
Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
QY 1 APTSSSTKKTQLEHLLLDLQMLNGINN 30
Db 2 APTSSSTKKTQLEHLLLDLQMLNGINN 31
|||||
RESULT 6
AAR95433
ID AAR95433 standard; Protein; 88 AA.
XX AC AAR95433;
XX
XX 17-SEP-1996 (first entry)
XX
DE Interleukin-2 ALPHA segment.
XX
KW Multifunctional protein; targetted hetero-association;
KW protein assembly; antibody engineering; interleukin-2; IL-2;
KW cytokine; tumour; therapy.
XX
OS Synthetic.
XX
PN WO9613583-A2.
XX
PD 09-MAY-1996.
XX
XX 20-OCT-1995; 95WO-EP04117.
XX
XX 20-OCT-1994; 94EP-0116558.
XX
XX (MORP-) MORPHOSYS GES PROTEINOPTIMIERUNG MBH.
XX PI Lupas A, pack P;
XX
XX WPI: 1996-239496/24.
XX DR N-PSDB; AAT15267.
XX
XX Targetted hetero-association of recombinant proteins to
XX multi-functional complexes - useful for therapeutic and diagnostic
```

PT purposes
 PS Example 3; Fig 13; 34pp; English.
 XX
 CC Human interleukin-2 (IL-2) can be used as an assembly device for
 CC the targetted hetero-association of recombinant proteins. The IL-2
 CC is segmented between His79 and Lys80 to form ALPHA (AAR95433) and
 CC BETA (AAR95434) segments encoded by MroI-AscI-HindIII gene cassettes
 CC (AAT15267 and AAT15268, respectively). The device combines the low
 CC immunogenicity of the plasmatic protein with a preferable effector
 CC function of the native-like cytokine structure and an inter-
 CC segmental cysteine bridge (Cys38-Cys105) after assembly. The
 CC combination of 1 or more antibody fragments against tumour antigens
 CC with additional cytokines, e.g. IL-6 or IL-12, targets the
 CC multi-cytokine complex directly to the tumour.
 XX
 SQ Sequence 88 AA;
 Query Match 100.0%; Score 147; DB 17; Length 88;
 Best Local Similarity 100.0%; Pred. No. 3.4e-13;
 Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
 OY 1 APTSSSTKKTQLEHLLDQMLNGINN 30
 DB 3 APTSSSTKKTQLEHLLDQMLNGINN 32
 RESULT 7
 AAR68899
 ID AAR68899 standard; peptide; 96 AA.
 XX
 AC AAR68899;
 XX
 DT 02-MAR-1995 (first entry)
 XX
 DE Human pro-insulin 2.
 XX
 KW pro-insulin; A-chain; B-chain; C-chain; disulphide;
 KW mercaptan; chaotropic agent.
 XX
 OS Homo sapiens.
 XX
 PN EP600372-A.
 XX
 PD 08-JUN-1994.
 XX
 PF 25-NOV-1993; 93EP-0118993.
 XX
 PR 02-DEC-1992; 92DE-4240420.
 XX
 PA (FARH) HOECHST AG.
 XX
 PI Gerl M, Ludwig J, Obermeier R, Sabel W;
 XX
 DR WPI; 1994-177718/22.
 XX
 PT Prodn. of pro-insulin with correct di-sulphide bridges - by
 PT treating recombinant precursor protein with mercaptan in alkali
 PT and in presence of chaotropic agent, then isolation on
 PT hydrophobic resin
 XX
 PS Disclosure; Page 11; 15pp; German.
 XX
 CC Pro-insulin is produced by treating recombinant precursor protein
 CC with a mercaptan to provide 2-10 SH residues per Cys residue, in
 CC presence of a chaotropic agent and in aq. medium of pH 10-11,
 CC treating the prod. with 3-50 g hydrophobic adsorber resin per 1 aq.
 CC medium of pH 4-7, isolating the adsorbed resin and pro-insulin and
 CC desorbing the pro-insulin. This method produces pro-insulin with
 CC correctly bonded Cys bridges. Compared with known methods it
 CC involves fewer stages (esp. no sulphatolysis or cyanogen bromide
 CC cleavage) and overall losses during purification are reduced, i.e.
 CC the process is quicker and gives better yields.

CC Sequences of insulin chain A, B and C are given in AAR68895-97.
 CC Sequences of pro-insulin 1-4 are given in AAR68898-901.
 XX
 SQ Sequence 96 AA;
 Query Match 100.0%; Score 147; DB 15; Length 96;
 Best Local Similarity 100.0%; Pred. No. 3.8e-13;
 Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
 OY 1 APTSSSTKKTQLEHLLDQMLNGINN 30
 DB 2 APTSSSTKKTQLEHLLDQMLNGINN 31
 RESULT 8
 AAR78662
 ID AAR78662 standard; protein; 96 AA.
 XX
 AC AAR78662;
 XX
 DT 03-APR-1996 (first entry)
 XX
 DE Fusion protein contg. proinsulin sequence 3.
 XX
 KW Proinsulin; post-translational modification; recombinant production;
 KW protein folding; conformation.
 XX
 OS Synthetic.
 XX
 FH Key Location/Qualifiers
 FT Region 41..44
 FT /label= R2
 FT /note= "a peptide of 4 amino acids"
 FT Peptide 45..74
 FT /label= R1-(B2-B29)-Y
 FT /note= "human insulin B-chain"
 FT Region 75
 FT /label= X
 FT Peptide 76..96
 FT /label= Gly-(A2-A20)-R3
 FT /note= "human insulin A-chain"
 XX
 PN EP68292-A2.
 XX
 XX 23-AUG-1995.
 XX
 PF 09-FEB-1995; 95EP-0101748.
 XX
 PR 18-FEB-1994; 94DE-4405179.
 XX
 PA (FARH) HOECHST AG.
 XX
 PI Gerl M, Ludwig J, Obermeier R, Sabel W;
 XX
 DR WPI; 1995-284754/38.
 XX
 PT Isolation of insulin that is correctly post-translationally
 PT processed - by reacting pro-insulin with a mercaptan in the presence
 PT of a chaotropic agent and purificn. after absorption to hydrophobic
 PT resin
 XX
 PS Example 2; Page 8; 16pp; German.
 XX
 CC The present sequence is that of a fusion protein, produced in E.coli
 CC which contains an example of a proinsulin molecule corresp.
 CC to the general formula R2-R1-(B2-B29)-Y-X-Gly-(A2-A20)-R3 (II). In
 CC formula (II), X = Lys, Arg or a peptide of 2-35 amino acids contg.
 CC Lys or Arg at the N- and C-termini; Y = a natural amino acid; R1 =
 CC Phe or Arg at the N- and C-termini; R3 = a natural amino
 CC contg. Arg or Lys at the N- and C-termini; R3 = a natural amino
 CC acid; (A2-A20) and (B2-B29) are the insulin A- and B-chain sequences
 CC from human or other insulin. The proinsulin molecule, released by
 CC cyanogen bromide, is reacted with mercaptan at a ratio of 2-10 SH

DR WPI; 1991-073489/10.
 DR N-PSDB; AAQ10779.
 XX
 PT Mutant interleukin -2 molecules binding to interleukin-2 receptor
 PT - linked with diphtheria toxin to treat eg interleukin-2
 PT receptor positive malignancies or prevent graft resection
 XX
 PS Claim 7; Page 9; 17pp; English.
 XX
 CC Ser(75), Lys(76) and Asn(77) have been deleted, as has His(79). The
 CC mutant IL-2 may be covalently linked to a portion of a toxin molecule
 CC eg diphtheria, which is large enough to have cytotoxic activity but
 CC small enough not to exhibit general eukaryotic cell binding. The IL-2
 CC /toxin hybrid can be used to treat immune disorders involving the IL-2
 CC receptor. The mutant IL-2 on its own can be used as an
 CC immunostimulant. See also AAQ10775-8, AAQ10780-Q10782.
 XX
 SQ Sequence 129 AA;
 Query Match 100.0%; Score 147; DB 12; Length 129;
 Best Local Similarity 100.0%; Pred. No. 5.2e-13;
 Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
 QY 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
 DB 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
 RESULT 12
 AAAR10908
 ID AAR10908 standard; Protein; 129 AA.
 AC AAR10908;
 DT 10-MAY-1991 (first entry)
 XX
 XX Interleukin-2 mutant psi 150 (delta76-79).
 DE Interleukin-2; IL-2; immunostimulant.
 KW Interleukin-2; IL-2; immunostimulant.
 XX Synthetic.
 OS
 XX WO9102000-A.
 PN
 XX 21-FEB-1991.
 PD
 XX 30-JUL-1990; 90WO-US04258.
 PF
 XX 02-AUG-1989; 89US-0388557.
 PR
 XX (SERA-) SERAGEN INC.
 PA
 PI Genbauffe FS, Akiyoshi D;
 XX
 XX WPI; 1991-073489/10.
 DR N-PSDB; AAQ10782.
 XX
 PT Mutant interleukin -2 molecules binding to interleukin-2 receptor
 PT - linked with diphtheria toxin to treat eg interleukin-2
 PT receptor positive malignancies or prevent graft resection
 XX
 PS Claim 4; Page 9; 17pp; English.
 XX
 CC Lys(76), Asn(77), Phe(78) and His(79) have been deleted. The mutant
 CC IL-2 may be covalently linked to a portion of a toxin molecule eg
 CC diphtheria, which is large enough to have cytotoxic activity but
 CC small enough not to exhibit general eukaryotic cell binding. The
 CC IL-2/toxin hybrid can be used to treat immune disorders involving
 CC the IL-2 receptor. The mutant IL-2 on its own can be used as an
 CC immunostimulant. See also AAQ10775-Q10781.
 XX
 SQ Sequence 129 AA;

Query Match 100.0%; Score 147; DB 12; Length 129;
 Best Local Similarity 100.0%; Pred. No. 5.2e-13;
 Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
 QY 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
 DB 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
 RESULT 13
 AAAR10907
 ID AAR10907 standard; Protein; 130 AA.
 AC AAR10907;
 DT 10-MAY-1991 (first entry)
 XX
 XX Interleukin-2 mutant psi 145 (delta76-78).
 DE Interleukin-2; IL-2; immunostimulant.
 KW Interleukin-2; IL-2; immunostimulant.
 XX Synthetic.
 OS
 XX WO9102000-A.
 PN
 XX 21-FEB-1991.
 PD
 XX 30-JUL-1990; 90WO-US04258.
 PF
 XX 02-AUG-1989; 89US-0388557.
 PR
 XX (SERA-) SERAGEN INC.
 PA
 PI Genbauffe FS, Akiyoshi D;
 XX
 XX WPI; 1991-073489/10.
 DR N-PSDB; AAQ10781.
 XX
 PT Mutant interleukin -2 molecules binding to interleukin-2 receptor
 PT - linked with diphtheria toxin to treat eg interleukin-2
 PT receptor positive malignancies or prevent graft resection
 XX
 PS Claim 4; Page 9; 17pp; English.
 XX
 CC Lys(76), Asn(77) and Phe(78) have been deleted. The mutant IL-2 may
 CC be covalently linked to a portion of a toxin molecule eg
 CC diphtheria, which is large enough to have cytotoxic activity but
 CC small enough not to exhibit general eukaryotic cell binding. The
 CC IL-2/toxin hybrid can be used to treat immune disorders involving
 CC the IL-2 receptor. The mutant IL-2 on its own can be used as an
 CC immunostimulant. See also AAQ10775-Q10780, AAQ10782
 XX
 SQ Sequence 130 AA;
 Query Match 100.0%; Score 147; DB 12; Length 130;
 Best Local Similarity 100.0%; Pred. No. 5.3e-13;
 Matches 30; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
 QY 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
 DB 1 APTSSSTKKTQLEHLLDLQMLNGINN 30
 RESULT 14
 AAP30044
 ID AAP30044 standard; peptide; 131 AA.
 AC AAP30044;
 DT 04-APR-1992 (first entry)
 XX
 XX Sequence of interleukin-2 (IL-2) II.
 DE
 XX

